

CALIFORNIA ENERGY COMMISSION

1516 Ninth Street, MS-29
Sacramento, California 95814

Web Site: www.energy.ca.gov



April 3, 2002

PROGRAM OPPORTUNITY NOTICE
Targeted Biomass Solicitation for Biogas Systems or
Anaerobic Digestion Technologies In California

Renewables Energy Program Area
Public Interest Energy Research Program
California Energy Commission

UP TO \$5 MILLION AVAILABLE FOR FUNDING BIOGAS PROJECTS

The California Energy Commission is opening a new funding opportunity for biomass projects through its Public Interest Energy Research (PIER) Program within the Renewables Energy Area. There will be up to \$5 million available to support the accelerated development of anaerobic digestion technologies (ADT) that will help make California's electricity more affordable, diverse, reliable, environmentally acceptable, and safe. This is a highly targeted, performance-based solicitation for ADT and only those candidates meeting the selection and scoring criteria in the Application Manual will be considered for grant awards. Biomass resources that are included for conversion to electricity using ADT are landfill wastes, livestock manure from dairies and swine operations, food processing wastes from food manufacturing and processing industries, and wastewater at wastewater treatment facilities.

The PIER Program, administered by the California Energy Commission, funds selected public interest energy RD&D efforts that will advance energy science or technology that are not adequately addressed by the competitive and regulated energy markets. PIER's mission is to conduct public interest energy RD&D that improves the quality of life for Californians by providing environmentally sound, safe, reliable and affordable energy services and products. Detailed information about the PIER program can be found on the Commission Web Site, at: www.energy.ca.gov/contracts.

Who may apply?

This is a targeted solicitation seeking technology developers or grant recipients who have demonstrated expertise and experience with development of biogas systems or ADT. Both private and public entities may apply for PIER funds. This solicitation represents a complementary RD&D effort to the Dairy Power Production Program being administered by the Commission under Legislative Enactment SB 5X (Section 5(b)(5)(C)(I)). Applicants who did not receive a grant under the Dairy Power Production Program due to the RD&D nature of their project are encouraged to apply to this solicitation.

What projects are eligible for funding?

Proposals are being solicited to accelerate and extend promising ADT for distributed generation applications in California. In general, proposed projects must integrate ADT and prime movers to address the following:

- Improving the cost competitiveness and affordability of biogas to electricity systems by:
 - Lowering capital cost, installation cost, operation and maintenance cost, and or life cycle costs; or
 - Developing new and other revenue streams or value-added products such as fertilizers and other chemicals; or
 - Improving biogas recovery and biogas-to-electricity conversion efficiencies.
- Assuring high likelihood of success and market connectedness by:
 - Having a project team capable of implementing successful ADT in the California market place.
 - Having a clear commercialization pathway.
- Improving the value of biogas systems or ADT facilities to California's electricity system, for example by:
 - Enhancing system reliability, peak load capability, dispatchability, availability, maintainability, durability, usability, and power quality; or
 - Supporting integration and aggregation of distributed generation and on-site generation with the power grid.
- Improving biogas systems or ADT that enhance environmental and public health benefits by:
 - Improving public health and safety (e.g., by avoiding possible explosions and fire hazards, decreasing exposure to vectors, and reducing fouling odors, etc.).
 - Reducing environmental impacts by exceeding current or meeting future California air and water quality regulations.

In light of these considerations, the Commission is particularly interested in ADT projects for electricity production in the areas listed below.

Landfill Gas to Electricity¹

- Innovative prime movers and advanced concepts currently not being demonstrated (e.g., fuel cells, Stirling engines, etc). Please note that proposals must address benefits other than air quality.
- Demonstrate cost-effective electricity production at transfer stations.
- Co-production of electricity and value-added products at landfills.
- RD&D focused on reducing the capital cost of microturbines or extending the life of microturbines using landfill gas.

¹ The Commission is currently funding efforts in accelerated decomposition of wastes at landfills. Consequently, accelerated decomposition efforts will not be considered for funding in this solicitation.

Wastewater Treatment to Electricity

- Innovative reactor designs that increase methane conversion rates and exceed current waste discharge requirements.
- Innovative prime movers (e.g., fuel cells, Stirling engines, etc).²
- Co-production of electricity and value-added products.
- Innovative processes that increase methane production (e.g., co-mingling of wastes) or decrease use of fresh water, or which help make electricity production at wastewater facilities more affordable.

Livestock Manure to Electricity (Focus on Dairy and Swine Operations)

- Innovative digester systems that address both improved methane recovery and reduced environmental impacts.
- Testing and demonstrating of innovative prime movers (e.g., microturbines, fuel cells, Stirling engines, etc).
- Steps to increase affordability of generating electricity using livestock wastes (e.g., by including co-production of value-added products, increasing efficiencies, etc.).

Food Processing Wastes to Electricity

- Emphasis on ADT using food processing wastes to generate electricity and thereby help meet on-site electrical demands, and which also provide environmental benefits (e.g., reduced landfilling or sewerage of food processing wastes).
- Co-production of electricity and value-added products.
- Innovative prime movers (e.g., microturbines, fuel cells, Stirling engines, etc).

Proposals outside the above areas will be considered. However, applicants proposing such projects are expected to describe how the project address critical electricity issues, the extent of environmental benefits, and a commercialization pathway. In addition, such proposals must fully respond to the requirements of Volume 2, Technical and Cost Information Section of the Application Manual.

Proposed RD&D projects must include hardware development of pilot plants or demonstration units. Feasibility studies and bench scale projects will not be funded under this solicitation. Applicants who are proposing feasibility studies and bench scale projects should consider applying to the Commission's Energy Innovation Small Grant Program. Similarly, other funding is available to reduce peak load and energy consumption using commercially available technologies through the Commission's Peak Load Reduction, Distributed Generation, and Renewable Energy Programs. Information on these programs is available through the Energy Commissions web site (<http://www.energy.ca.gov>).

How much financial assistance is available?

The total PIER funding for this solicitation is anticipated to be up to \$5 million. A single proposal may request no more than \$500,000 in PIER funding. The Commission reserves the right to augment or reduce these amounts during this solicitation process.

² Microturbines are currently being demonstrated at California wastewater treatment plants and, consequently, will not be considered for funding under this solicitation.

An applicant may submit only one proposal per project. However, an applicant may submit multiple proposals if each proposal is for a different project.

What type of funding assistance is available?

All funding through this solicitation will be provided as grants.

What are the application, award, and project start dates?

Pre-Proposal Conference Heritage Complex 4500 S. Laspina St. Tulare, CA 93274	April 10, 2002 1:00 to 5:00 PM
Pre-Proposal Conference Hearing Room A, California Energy Commission 1516 Ninth St, Sacramento, CA 95814	April 12, 2002 1:00 to 5:00 PM
Post Question and Answers from Pre-Proposal Conferences (See Commission's Web Site)	April 16, 2002
Deadline to Submit Proposals	May 15, 2002 4:00 PM
Review Proposals	May 20 – June 11, 2002
Interview Applicants (if necessary)	June 12-17, 2002
Post Notice of Award	June 24, 2002
Commission Business Meeting	June 26, 2002

How do I get application materials?

The Commission invites you to contact us regarding this solicitation. This Targeted Solicitation is available on the following Web Site:

Energy Commission: www.energy.ca.gov/contracts/

Copies may be obtained by writing or calling:

**Research and Development Office
California Energy Commission
1516 Ninth Street, MS-43
Sacramento, California 95814
Telephone: 916-654-5129
FAX: 916-653-6010**

If you would like an Application Manual mailed to you, please complete the following form and mail or fax it to the indicated address.

**TARGETED BIOMASS SOLICITATION FOR BIOGAS SYSTEMS OR
ANAEROBIC DIGESTION TECHNOLOGIES IN CALIFORNIA**

Application Manual Request Form

Yes! Send me a copy of the April 2002 Application Manual.

Please check the **one** category that best characterizes your status:

☐ **Private For-Profit Entity**

☐ **Public**

☐ **Other (Specify)** _____

Name

Title

Company or Organization

Street Address

Mailing Address (if different from street address)

City (please do not abbreviate)

STATE

ZIP

(_____)_____
Telephone Number (include area code)

(_____)_____
Fax Number (include area code)

E-mail Address: _____

Mail or fax to:

**Research and Development Office
California Energy Commission
1516 Ninth Street, MS-43
Sacramento, California 95814
Telephone: (916) 654-5129
FAX: (916) 653-6010**

APPLICATION MANUAL

THE RENEWABLES ENERGY PROGRAM AREA PUBLIC INTEREST ENERGY RESEARCH PROGRAM



“TARGETED BIOMASS SOLICITATION FOR BIOGAS SYSTEMS OR ANAEROBIC DIGESTION TECHNOLOGIES IN CALIFORNIA”



**State of California
California Energy Commission**
April 3, 2002

**Questions or clarifications about this Targeted Solicitation
should be directed to:**

Valentino Tiangco
Research and Development Office
California Energy Commission
1516 Ninth Street, MS-43
Sacramento, California 95814
Telephone: 916-654-4664
FAX: 916-653-6010
Email: vtiangco@energy.state.ca.us

**This Targeted Solicitation is available on the following Web
Site:**

Energy Commission:

<http://www.energy.ca.gov/research>

Copies may be obtained by writing or calling:

Research and Development Office
Technology Systems Division
PIER Program
California Energy Commission
1516 Ninth Street, MS-43
Sacramento, California 95814
Telephone: 916-654-5129
FAX: 916-653-6010

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V. Application Manual Attachments and Forms

Attachment No.	Attachment Title
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Volume 1 Forms

- | | |
|---|--|
| 1 | Application and Project Information Form |
| 2 | Project Team List, Key Personnel, Key Subcontractors <ul style="list-style-type: none">• Narrative Description of Skill and Experience• Resumes |

Volume 2 Forms

- | | |
|---|--|
| 3 | Executive Summary Form |
| 4 | Grant Terms and Conditions |
| 5 | Work Statement (Grant Exhibit A) |
| 6 | Content and Format of Progress Reports (Grant Attachment 1) |
| 7 | Final Report Instructions (Grant Attachment 2) |
| 8 | Products and Due Dates (Grant Exhibit B) |
| 8 | Gantt Chart (Grant Exhibit B) |
| 9 | Instructions For Providing Budget Information |
| 9 | Personal Hourly Rates and Benefits (Grant Exhibit C1) |
| 9 | Calculation of Rates (Grant Exhibit C2) |
| 9 | Detailed Task Budgets (Grant Exhibit C3) |
| 9 | Summary of Allowable Travel and Per Diem Expenses (Grant Exhibit C4) |

Volume 3 Confidential Information

- | | |
|----|--|
| 10 | Confidential and Pre-Existing Intellectual Property List (Grant Exhibit D) |
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I. Introduction

How is this Solicitation Organized?

This Biomass Targeted Solicitation for Anaerobic Digestion Technologies is organized into the following sections:

- Section I. Introduction
- Section II. General Overview
- Section III. Questions about this Biomass Targeted Solicitation for Anaerobic Digestion Technologies (ADT)
 - A. Questions Related to Biomass/PIER Renewables Energy Program Area
 - B. Questions Related to Proposal Format and Required Documents
 - C. Questions Related to Evaluation Process and Scoring Criteria
 - D. Questions Related to Submission of Applications
- Section IV. Key Words and Definitions
- Section V. Application Manual Attachments and Forms

II. General Overview

What is the General Overview of this Solicitation?

This is a Biomass Targeted Solicitation for **Advanced Biogas Systems or Advanced Anaerobic Digestion Technologies** (ADT) in California with funding from the Public Interest Energy Research (PIER) Program under the Biomass/Renewables Energy Subject Area. The purpose of this solicitation is to provide funding to support and facilitate the accelerated development of ADT for distributed generation applications that will help California's electricity become more affordable, diverse, reliable, environmentally acceptable, and safe. This is a highly targeted, performance-based solicitation for ADT and only those candidates meeting the selection and scoring criteria stipulated in this Application Manual will be considered for grant award. Biomass resources that are included for conversion to electricity using ADT are landfill wastes, livestock manure from dairies and swine operations, food-processing wastes from food manufacturing and processing industries, wastewater at wastewater treatment facilities.

There will be up to \$5 million in PIER grants available to fund this targeted solicitation for ADT research, development, and demonstration (RD&D). A single proposal may request no more than \$500,000 in PIER funding.

Technology developers for ADT are targeted grant Recipients under this solicitation. Under the direction and coordination of grant Recipients, teams of subcontractors including RD&D organizations, individuals, businesses, farm owners, utilities, and public or private research institutions will be responsible for creating the RD&D advancements in ADT. Applicants utilizing dairy wastes that did not meet the requirements for the Dairy Power Production Program, which is being administered by the Commission acting

under authority of Legislative Enactment SB 5X (Section 5(b)(5)(C)(I)), are encouraged to submit proposals that will help advance biogas systems or ADT.

The PIER Program, administered by the California Energy Commission, funds certain public interest energy RD&D efforts that will advance energy science or technology and benefit California ratepayers in a way not adequately provided by competitive and regulated energy markets. PIER's mission is to conduct public interest energy RD&D that improves the quality of life for Californians by providing environmentally sound, safe, reliable and affordable energy services and products. Detailed information about the PIER program can be found on the Commission web site at <http://www.energy.ca.gov/research>

III. Questions about this Biomass Targeted Solicitation for Anaerobic Digestion Technologies (ADT)

The following questions and answers should provide prospective applicants with valuable information about this RD&D effort and the application process. All applicants are strongly encouraged to submit any questions about this solicitation to the Commission's Research and Development Office, and to attend the pre-bid conferences noted below.

What is the Schedule for this Solicitation?

Pre-Proposal Conference Heritage Complex 4500 South Laspina St Tulare, CA 93274	April 10, 2002 1:00 to 5:00 PM
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Commission Business Meeting	June 26, 2002

A. Questions Related to Biomass/PIER Renewables Energy Program Area

What is the PIER Program and How is it Related to this Biomass Targeted Solicitation?

In 1996, Governor Wilson signed into law Assembly Bill (AB) 1890 (1996 California Statutes, Chapter 854) which provided authority for a fundamental restructuring of California's electric services industry. Among other things, AB 1890 added Section 381 to the Public Utilities Code, requiring that at least \$62.5 million be collected annually from investor-owned electric utility ratepayers for “public interest” energy RD&D efforts not adequately provided by competitive and regulated markets. Of this amount, the Commission administers \$61.8 million per year through the PIER program.

Since the funds for the PIER program are paid by specified investor owned utility (IOU) electricity ratepayers, the RD&D efforts supported by these funds *must* provide benefits to these electricity ratepayers. However, while the program will emphasize electricity-related RD&D activities, RD&D efforts that benefit other types of energy users may also qualify for PIER funding *if* such projects *also* provide benefits to electricity ratepayers as well.

On September 30, 2000, the Governor signed AB 995 (Wright) extending PIER until January 1, 2010 and allocating \$62.5 million per year to the program.

Following a statewide collaborative effort, the Commission adopted its “*Strategic Plan For Implementing The RD&D Provisions Of AB 1890.*” (Commission Publication No. P500-97-007, June 1997.) The Commission’s RD&D Strategic Plan identified the overall mission of the PIER program as follows:

“The mission of the ‘Public Interest Energy Research’ program is to conduct public interest energy research that seeks to improve the quality of life for California’s citizens by providing environmentally sound, safe, reliable and affordable energy services and products. ‘Public interest energy research’ includes the full range of research, development and demonstration activities that will advance science or technology not adequately provided by competitive and regulated markets.”

What are PIER Program Areas?

Senate Bill (SB) 90 was enacted into law (1997 California Statutes, Chapter 905) in 1997. Among other things, this legislation established certain administration and expenditure criteria for the PIER Program, and required the program portfolio to include five “relevant core subject areas.” The five core research subject areas included in PIER were renewable energy, environmentally preferred advanced generation, energy-related environmental enhancements, end-use energy efficiency, and strategic energy research. (See Public Resources Code Sections 25620 *et seq.*) After the passage of SB 90, the Commission divided the end-use energy efficiency core subject area into two efficiency program areas, namely (1) Buildings, and (2) Industrial/Agricultural/Water.

In the renewables energy program area, there are 6 subject areas being covered: biomass, photovoltaic, solar thermal, geothermal, small hydro and wind.

This solicitation covers biomass RD&D within the Renewables Energy Program area. Specifically, this solicitation targets accelerated development of ADT in California. ADT includes landfill gas to energy conversion systems, anaerobic digestion of livestock manure, wastewater, and food processing wastes.

What is the Purpose of this Biomass Targeted Solicitation?

The purpose of this solicitation is to conduct RD&D that will accelerate the development of anaerobic digestion of biomass resources to electricity systems. California is fortunate to have abundant biomass resources that can help provide generation capacity to the state's electricity system. Biomass resources are widely dispersed throughout the state and by advancing biogas or ADT to electricity systems will enable electricity end-users new options to provide on-site supply of electricity as an alternative to, or parallel with conventional utility grid electricity in both urban and rural areas.

Why Target Biogas Resources for Electricity Generation?

California is currently experiencing significant problems and uncertainty regarding its electricity market. The vision of an increasingly clean, affordable, and reliable electricity system has not been met. The 2001 scarce power, power outages and blackouts underscore the need for reliable, cheap, distributed generation technologies such as ADT. Scarce power, power outages and blackouts connote higher energy costs, especially during peak demand periods when rates are highest. One possible solution that can help current electricity system problems and help prevent similar problems in the future involves use of distributed generation from biomass energy technologies. Advanced ADT must be developed to meet this need to help offset the purchase of peak electricity demands, help avoid any future blackouts in California, and capture environmental benefits such as reductions in odor, air and groundwater pollutants associated with processing livestock manure, food processing wastes, wastewater and landfill wastes.

Our estimates show that ADT can provide up to 237 megawatts (MW) of generating capacity in the near term in California. These estimates are based on landfill gas to electricity potential of 97 MW, wastewater to electricity potential of 40 MW, and livestock manure to electricity potential of 100 MW. These estimates do not take into account the electricity potential using food processing wastes, which is believed to be large but unknown at the moment.

Landfills

California has over 3000 landfills that have been receiving organic wastes for over thirty years. Over 310 landfills and over 170 transfer stations are active and will continue to receive waste materials for at least the next twenty years. Due to the decomposition of organic material contained in the municipal solid waste stream, landfills are a significant source of methane that can be converted to electricity that would otherwise be emitted to the atmosphere. Currently, forty-two landfill-gas-to-electricity projects are located in California representing approximately 210 MW of generating capacity. Over twenty

more projects are in advanced planning stages and will contribute an additional 29 MW of capacity. Nearly all of the existing projects and projects in advanced planning are located at large landfills where generating capacities are typically larger than one MW. Future landfill gas projects will be significantly different from those already operating in the state. Prime mover capacities will be smaller (below 500 kW), air quality regulations are likely to be more stringent, and uncertainties in electricity prices may strongly influence the performance aspects of the generating systems. Landfill gas at many sites are being flared and vented to atmosphere. There is an increasing pressure to control and destroy landfill gas. There is also an increasing pressure to control emissions (NO_x, CO, VOC) from prime movers fueled by landfill gas. Typically, internal combustion (IC) engines are the current common prime mover of choice for the size range of these landfills. However, current IC engines have high air emissions, especially NO_x, which is likely to decrease their use in the future. Consequently the Commission is interested in encouraging development of cleaner alternatives.

Energy conversion of landfill gas makes sense if the conversion pathway is affordable and cost-effective. Microturbines are already being demonstrated at landfills in California. The Commission is investigating accelerated landfill decomposition through the Yolo County project and possibly in Chino Basin. Similarly, the Commission is co-funding the modified microturbine (flexmicroturbine) to utilize very low Btu landfill gas and the cleaning-up of Saloxane from landfill gas. Given the size of landfills that will be developed in the future for LFGTE systems, the environmental considerations, and the degree to which microturbines are being demonstrated in LFGTE, we expect microturbines to become the prime mover candidate in future LFGTE projects. For these reasons, our targets and stretch goals will be based on LFGTE systems using microturbines as standard.

Wastewater

The state has 242 sewage wastewater treatment facilities. Anaerobic digesters exist in a number of these sewage treatment plants and opportunity exists for further development. About 38 MW of electrical power is generated from 10 sewage wastewater treatment plants. The remaining 220 wastewater treatment facilities either don't recover biogas produced from anaerobic digesters or do not have anaerobic digesters on sites. Approximately 40 MW of electrical potential can be recovered from these 220 sewage wastewater plants and most of these facilities have a biogas to electricity potential less than 200 kW.

Livestock manure

One of the biggest challenges that livestock producers face is managing manure and process water in a way that controls odors and protects environmental quality. Biogas systems or ADT can help producers to meet this challenge while helping producers meet their onsite electricity demands. The environmental benefits include odor control, improved air and water quality, improved nutrient management flexibility, and the opportunity to capture biogas for electricity production. About 18 farm-scaled digesters were built in late 1970's and early 1980's in California. Only five of these systems are running today; three of these are on pig farms and two of these are on dairy farms generating total of 370 kW of power. Livestock manure to electricity potential is estimated to be over 100 MW. Seventy-three percent of this electricity potential (73 MW)

comes from California dairies while another 3 MW potential is available from swine operations.

Food processing wastes

California is the home of the largest food manufacturing and processing economy in the nation and is the leader of food and agricultural production for more than 50 years. There are about 3,500 food manufacturing and processing facilities in the entire state. The food processing wastes and electricity potential from anaerobic digestion of these wastes could be large but it's unaccounted for at the moment.

What is the Scope of Acceptable Projects?

The advancement of science and technology through the development of biogas systems and ADT using the above biomass resources can provide lasting technological solutions to mitigate energy problems, particularly if RD&D is directed in meeting California's specific needs. Proposals are being solicited to accelerate and extend promising ADT for distributed generation applications. In general, proposed projects must integrate ADT and prime movers to address the following:

- Improving the cost competitiveness and affordability of biogas to electricity systems by:
 - Lowering capital cost, installation cost, operation and maintenance cost, and or life cycle costs; or
 - Developing new and other revenue streams or value-added products such as fertilizers and other chemicals; or
 - Improving biogas recovery and biogas-to-electricity conversion efficiencies.
- Assuring high likelihood of success and market connectedness by:
 - Having a project team capable of implementing successful ADT in the California market place.
 - Having a clear commercialization pathway.
- Improving the value of biogas systems or ADT facilities to California's electricity system, for example by:
 - Enhancing system reliability, peak load capability, dispatchability, availability, maintainability, durability, usability, and power quality; or
 - Supporting integration and aggregation of distributed generation and on-site generation with the power grid.
- Improving biogas systems or ADT that enhance environmental and public health benefits by:
 - Improving public health and safety (e.g., by avoiding possible explosions and fire hazards, decreasing exposure to vectors, and reducing fouling odors, etc.).
 - Reducing environmental impacts by exceeding current or meeting future California air and water quality regulations.

In light of these considerations, the Commission is particularly interested in ADT projects for electricity production in the areas listed below.

Landfill Gas to Electricity¹

- Innovative prime movers and advanced concepts currently not being demonstrated (e.g., fuel cells, Stirling engines, etc). Please note that proposals must address benefits other than air quality.
- Demonstrate cost-effective electricity production at transfer stations.
- Co-production of electricity and value-added products at landfills.
- RD&D focused on reducing the capital cost of microturbines or extending the life of microturbines using landfill gas.

Wastewater Treatment to Electricity

- Innovative reactor designs that increase methane conversion rates and exceed current discharge requirements.
- Innovative prime movers (e.g., fuel cells, Stirling engines, etc).²
- Co-production of electricity and value-added products.
- Innovative processes that increase methane production (e.g., by co-mingling of wastes), or decrease use of fresh water, or which help make electricity production at wastewater facilities more affordable.

Livestock Manure to Electricity (Focus on Dairy and Swine Operations)

- Innovative digester systems that address both improved methane recovery and reduced environmental impacts.
- Testing and demonstrating of innovative prime movers (e.g., microturbines, fuel cells, Stirling engines, etc).
- Steps to increase affordability of generating electricity using livestock wastes (e.g., by including co-production of value-added products, increasing efficiencies, etc.).

Food Processing Wastes to Electricity

- Emphasis on ADT using food processing wastes to generate electricity and thereby help meet on-site electrical demands, and which also provide environmental benefits (e.g., reduced landfilling or sewerage of food processing wastes).
- Co-production of electricity and value-added products.
- Innovative prime movers (e.g., microturbines, fuel cells, Stirling engines, etc).

Proposals outside the above areas will be considered. However, applicants proposing such projects are expected to describe how the project address critical electricity issues, the extent of environmental benefits, and a commercialization pathway. In addition, such proposals must fully respond to the requirements of Volume 2, Technical and Cost Information Section of the Application Manual.

Proposed RD&D projects must include hardware development of pilot plants or demonstration units. Feasibility studies and bench scale projects will not be funded under this solicitation. Applicants who are proposing feasibility studies and bench scale projects should consider applying to the Commission's Energy Innovation Small Grant Program. Similarly, other funding is available to reduce peak load and energy consumption using

¹ The Commission is currently funding efforts in accelerated decomposition of wastes at landfills. Consequently, accelerated decomposition efforts will not be considered for funding in this solicitation.

² Microturbines are currently being demonstrated at California wastewater treatment plants and, consequently, will not be considered for funding under this solicitation

commercially available technologies through the Commission's Peak Load Reduction, Distributed Generation, and Renewable Energy Programs. Information on these programs is available through the Energy Commissions web site (<http://www.energy.ca.gov>).

What are the Targets and Stretch Goals for this Solicitation?

In view of the above scope and focus of this solicitation, applicants should use the following Targets and Stretch Goals in developing their project applications. Note that these targets and stretch goals are quantitative.

Table 1. Performance Targets and Stretch Goals for ADT Solicitation

Focus Area	Target Parameter	Agreement Target	Stretch Goal
Landfill Gas to Electricity (LFGTE)	Air Emissions ³		
	NO _x (lb/MM Btu)	0.01	0.0005
	VOC (lb/MM Btu)	0.007	0.001
	CO (lb/MM Btu)	0.10	0.002
	Affordability		
	COE (\$/kWh)	<0.06	<0.04
	Capital Costs		
	Energy Recovery System ⁴ (\$/kW)	<2,000	<1,000
	Prime Mover (\$/kW)	<1,000	<500
	Prime Mover Heat Rate (Btu/kWh)	<11,000	<8000
	Prime mover lifetime ⁵ on landfill gas (hours)	>5,000	>10,000
	Capacity Factors (%)	>90	>95

Focus Area	Target Parameter	Agreement Target	Stretch Goal
Wastewater to electricity	Air Emissions ³		
	NO _x (lb/MM Btu)	0.01	0.0005
	VOC (lb/MM Btu)	0.007	0.001
	CO (lb/MM Btu)	0.10	0.002
	Affordability		
	COE (\$/kWh)	<0.06	<0.04
	Capital Costs		
	Energy recovery system ⁴ (\$/kW)	<2000	<1000
	Prime mover (\$/kW)	<1000	<500
	Biogas production system ⁶ (\$/kW)	<1000	<500
	Prime mover		
	Heat rate (Btu/kWh)	<11000	<8000

³ Air emissions based on HHV of 500 Btu/scf and 15% O₂.

⁴ Energy recovery system includes gas clean up, prime mover and interconnection hardware.

⁵ Lifetime means hours of operation without major equipment replacement.

	Lifetime ⁵ on biogas (hours)	>5000	>10000
	CH ₄ Yield (ft ³ of CH ₄ /dry lbm of VS added)	>7.5	>8.0

Focus Area	Target Parameter	Agreement Target	Stretch Goal
Livestock Manure to Electricity	Air Emissions ³		
	NO _x (lb/MM Btu)	0.01	0.0005
	VOC (lb/MM Btu)	0.007	0.001
	CO (lb/MM Btu)	0.10	0.002
	Affordability		
	COE (\$/kWh)	<0.06	<0.04
	Capital Costs		
	Energy recovery system ⁴ (\$/kW)	<2000	<1000
	Prime mover (\$/kW)	<1000	<500
	Biogas production system ⁶ (\$/kW)	<1000	<500
	Prime mover		
	Heat rate (Btu/kWh)	<11000	<8000
	Lifetime ⁵ on biogas (hours)	>5000	>10000
	CH ₄ Yield (ft ³ of CH ₄ /dry lbm of VS added)		
	Dairy	>6.0	>6.5
	Swine	>7.0	>7.5
	Capacity Factor (%)	>90	>95

Focus Area	Target Parameter	Agreement Target	Stretch Goal
Food Processing Wastes to Electricity	Air Emissions ³		
	NO _x (lb/MM Btu)	0.01	0.0005
	VOC (lb/MM Btu)	0.007	0.001
	CO (lb/MM Btu)	0.10	0.002
	Affordability		
	COE (\$/kWh)	<0.06	<0.04
	Capital Costs		
	Energy recovery system ⁴ (\$/kW)	<2000	<1000
	Prime mover (\$/kW)	<1000	<500
	Biogas production system ⁶ (\$/kW)	<1000	<500
	Prime mover		
	Heat rate (Btu/kWh)	<11000	<8000
	Lifetime ⁵ on biogas (hours)	>5000	>10000
	CH ₄ Recovery (ft ³ of CH ₄ /dry lbm of COD added)	>7.5	>8.0
	Capacity Factor (%)	>90	>95

⁶ Biogas production system includes digester and gas recovery but excludes energy recovery.

How Much Financial Assistance is Available?

The total PIER funding for this solicitation is anticipated to be up to \$5 million. A single proposal may request no more than \$500,000 in PIER funding. The Commission reserves the right to augment or reduce these amounts during this solicitation process.

An applicant may submit only one proposal per project. However, an applicant may submit multiple proposals if each proposal is for different project.

What are the Match Funding Requirements?

Match funding is required to participate in this targeted solicitation and match funding is evaluated and scored as one of the evaluation criteria. Care should be taken to provide match funding in amounts proportional to expected private benefits compared to public benefits generated by the program. In other words, projects providing a higher percentage of private benefits and lower percentage of public benefits should contribute a higher percentage of match funds. The ratio of match funding to PIER funding should reflect the ratio of private benefits to public benefits resulting from successful completion of the project. For additional information regarding match funding, see Section III. B. 7, "Project Costs."

Will this Award be a Grant, Loan or Contract?

All funding through this solicitation will be provided as grants.

How and When will Funds be Distributed?

Commission funds are paid on a reimbursement basis. Payment will be made approximately 45 days after the Commission receives a properly submitted, undisputed invoice. The Commission will retain 10 percent of any payment request or 10 percent of the total Commission award at the end of the project. These retained funds will be released when the Commission Project Manager is satisfied that the terms of the grant agreement have been fulfilled.

How do I Apply and What is the Process?

First, the Program Opportunity Notice and Application Manual for this Targeted Solicitation are released. Then, pre-proposal conferences will be held in different locations in the State to respond to applicants' questions. The Commission will distribute questions and answers received from the pre-bid conferences and posted on the web. Applicants are required to submit a detailed proposal by the due date and time. Commission staff will conduct eligibility, completeness, and feasibility screening of proposals. Proposals that do not pass the eligibility, completeness, and feasibility screening criteria will not advance to the next stage of proposal review, which is the evaluation and scoring phase. The scoring committee will independently evaluate and score proposals. Then the proposals receiving passing scores will be submitted to the Commission's R&D Committee. The R&D Committee reviews and recommends to the full Commission how many of these projects to fund, beginning with the highest score (in

descending order). The Commission then approves the final grant agreements to the winning applicants.

Applicants are required to submit as much technical information as they believe is needed to describe their proposed ADT advancements without including any confidential information. Applicants are required to provide a copy of ADT schematics, along with other supporting documents as outlined in “What is Required in Volume 2- Technical & Cost Information for a Proposal.”

Who can Apply to this Solicitation?

This is a targeted solicitation seeking technology developers or grant recipients who have demonstrated expertise and experience with development of biogas systems or ADT. Both private and public entities may apply for PIER funds. This solicitation represents a complementary R&D effort to the Dairy Power Production Program being administered by the Commission under Legislative Enactment SB 5X (Section 5(b)(5)(C)(I)). Applicants who did not receive a grant under the Dairy Power Production Program due to the RD&D nature of their project are encouraged to apply to this solicitation.

Will there be an Opportunity to Meet with the Commission about this Solicitation?

Yes, as indicated in the schedule, there will be two Pre-Proposal Conferences; participation in these meetings is optional but encouraged.

The Pre-Proposal Conferences will be held at the dates, times, and places listed below. Participation by prospective applicants is optional. Please call (916) 654-5129 or refer to the Commission's web site at www.energy.ca.gov to confirm the date and time.

Tulare, CA	Sacramento, CA
April 10, 2002 (Wednesday)	April 12, 2002 (Friday)
1:00 to 5:00 p.m.	1:00 to 5:00 p.m.
Heritage Complex 4500 South Laspina Street Tulare, CA 93274	California Energy Commission Hearing Room A, First Floor 1516 Ninth Street Sacramento, California 95814
Telephone: (559) 688-1030	Telephone: (916) 654-4392

How Do I ask Questions about this Solicitation?

During the solicitation process, questions or clarifications about this Biomass Targeted Solicitation must be directed to the Biomass Technical Lead as listed below. You may submit written questions up to the day of the last Pre-Proposal Conference and you may ask questions at the Pre-Proposal Conferences. Questions may be submitted in writing via mail, electronic mail, FAX, verbally, and by phone. The questions and answers will be mailed to all parties who request a copy of this Application Manual from the Commission

Research and Development Office or attend a Pre-Proposal Conference. The questions and answers will also be posted on the Commission's web site at:
<http://www.energy.ca.gov/research>

Who Do I Contact for Information Regarding this Solicitation?

VALENTINO TIANGCO
BIOMASS TECHNICAL LEAD/PIER RENEWABLES
Research and Development Office
California Energy Commission
1516 Ninth Street, MS-43
Sacramento, California 95814
Telephone: (916) 654-4664
FAX: (916) 653-6010
E-mail: vtiangco@energy.state.ca.us

Verbal Communication

Any verbal communication with a Commission employee concerning this solicitation is not binding on the State and shall in no way alter a specification, term, or condition of the Application Manual.

B. Questions Related to Proposal Format and Required Documents

This section contains the detailed technical and mandatory proposal format requirements and the approach to be used by the Applicant for the development and presentation of proposal information and data. The format is prescribed to assist the Applicant in meeting State requirements and to enable the Commission to evaluate each proposal uniformly and fairly. Format instructions must be adhered to, all requirements and questions in the Solicitation must be responded to, and all required data must be supplied.

Is there a Limitation in the Proposal Format and Length?

Proposals must be presented in a clear, complete, and concise manner. Volume II and optional Volume III should be kept to a combined maximum of forty (40) pages of text (exclusive of the Work Statement, budget spreadsheets, resumes, and attachments offered by the Applicant). Applicants are strongly encouraged to limit the length of their proposals while adequately covering the proposal requirements.

Applicants who believe that supporting documentation or additional explanations beyond the forty (40) page limit are needed may attach such information in appendices to their proposal. Appendices are appropriate for items such as calculations of public and private benefits and associated discussions, calculations of performance enhancements resulting from successful completion of the proposed work, and summaries of accomplishments from previous RD&D projects that are relevant to the proposed project.

What is the Required Format for a Proposal?

All proposals that are submitted under this solicitation must be typed or printed using a standard 11-point font, singled-spaced, and contain a blank line between paragraphs. Pages must be numbered and sections must be titled. Spiral or comb binding is preferred. Colored photographs and colored graphs are discouraged.

Applicants must submit the original and 12 paper copies of Volume 1, Volume 2, and optional Volume 3. Submittals must be printed back to back.

Applicants must also submit electronic files of the proposal on CD-ROM or 100 or 250 MB zip diskette along with the paper submittal. Electronic files must be in Microsoft Word '97 and Excel '97 formats.

Electronic files submitted via e-mail will not be accepted.

Applicant(s), you should organize your proposal as follows:

Volume 1 Administrative Section

Cover Letter

Application and Program Information Form, Attachment 1

Project Team List, Key Personnel, Key Subcontractors

- Narrative Description of Skill and Experience
- Key Personnel and Key Subcontractors form, Attachment 2
- Resumes

Volume 2 Technical and Cost Section

Table of Contents

Executive Summary, Attachment

Section 1 Scientific and Technological Baseline
Resource Assessment

Section 2 Technical and Economic Feasibility Study

Section 3 Problem Statement

Section 4 Project Goals and Objectives Narrative

ADT System Performance Characteristics, Targets and Stretch Goals

Section 5 Technical Approach and Probability of Success

Section 6 Market-Connected Benefits of Successful Completion of the Project

Section 7 Work Statement, Attachment 5 (Grant Exhibit A)

Products, Due Dates and Gantt Chart, Attachment 8 (Grant Exhibit B)

Section 8 Project Costs:

- ❑ PIER Funding Request Narrative
- ❑ Match Funding Narrative
- ❑ Need for PIER funding narrative
- ❑ Project Budget forms:
 - Personnel Hourly Rates and Benefits, Attachment 9 (Grant Exhibit C1)
 - Detailed Task Budgets, Attachment 9 (Grant Exhibit C3)

Volume 3 Confidential Information, if applicable

List of Confidential Information and Intellectual Property, Attachment 10

Copy of Confidential Submittal

What is Required in Volume 1 - Administrative Information?

The following is a list and brief description of the items (sections) that must be submitted in Volume 1 of each proposal. Applicants should carefully read this format and content information (along with the eligibility, completeness and feasibility criteria, and the evaluation criteria presented subsequently) to understand the relative importance of the information being requested in the proposal. The following items must be included or the proposal will fail the completeness screening and will be rejected prior to technical evaluations.

1. Cover Letter

The Applicant must submit a cover letter on company letterhead signed by a person who has the authority to bind the Applicant to a grant agreement for the proposed work.

2. Application and Project Information Form

Complete the Application and Program Information Form (Attachment 1). Have a person who is authorized to sign grant agreement for your company sign the original of this form as the “Authorized Official.” Note that this Application and Program Information Form, Item Number 6, Type of Entity or Business Organization, advises submittal of Articles of Incorporation, Partnership Agreement, and Fictitious Name Filing where appropriate.

3. Skill and Experience

Project Team Narrative

Name the Project Director who will be the Recipient’s person who is primarily responsible for coordinating and managing the proposed project and describe each of the following:

- The Project Director’s capabilities and experience in managing successful ADT-related RD&D projects.
- The process the Project Director will take to effectively manage the proposed project to achieve project objectives and goals, including ensuring the development of quality products within the allocated budget and schedule.
- How the Project Director will monitor progress and develop recommendations for adjusting the research direction and focus based upon the results of research.

Describe the capabilities and experience of the proposed project team:

- Identify the key RD&D personnel of the Recipient, key subcontractors, and key personnel of the key subcontractors.
- Describe the capabilities of the team members to conduct the technical work proposed, administer the research process, control costs, maintain project schedule, and if applicable, move the products into the marketplace, with reference to past experiences.

- Describe how the project team is uniquely or unusually well qualified to perform the proposed effort.

Key Personnel and Key Subcontractors

List Recipient's key personnel, subcontractor's key personnel and key subcontractors in the project, use Application Manual Attachment 2.

Briefly, "keys" are those individuals or subcontractors/vendors who would be difficult to replace and could impact the project progress/outcome. The Commission has approval rights if replacing these individuals or vendors. See Attachment 4, Grants Terms and Conditions.

Resumes

Provide resumes for the Project Director, the task leaders, key project team members and key subcontractors. Emphasize individual accomplishments in the resumes relevant to the proposed project.

What is Required in Volume 2 – Technical and Cost Information?

The technical merit of the proposal will be evaluated and scored on the Applicant's submittal in the Technical and Cost Section of the Proposal. The Applicant is responsible for submitting a technically complete and responsive proposal, and for presenting compelling and convincing evidence that the proposal is worthy of PIER funding. In scoring the proposal, the Commission evaluation team will not depend upon its prior detailed knowledge of ADT system technological status, issues and markets, or any prior work that the Applicant has done for the Commission. Therefore, the Technical and Cost Section of the Proposal should be clear and concise and should address the submittal requirements completely.

The Applicant can assume that proposal evaluators are familiar with the electricity supply and demand situation in California, natural gas supply issues, biomass issues, electric utility restructuring, proceedings before the California Energy Commission and the California Public Utilities Commission related to: biomass, biogas systems or ADT systems, renewable distributed generation and interconnection, and interconnection issues and standards development. Therefore, the Applicant should not discuss issues such as the potential for ADT systems to be used as Distributed Energy Resources (DER) and the roles that DER can serve in terms of system reliability and electricity supply, unless such discussions are integral to the scope of the proposal's work statement. The applicant's discussions should always focus on the proposed project and expected results.

Applicants who believe that supporting documentation beyond that requested for Volume 2 is needed and will improve their technical score may attach such information in appendices to their proposal. Appendices are appropriate for items such as description of work being done by the project team on related projects, the Applicant's quality control and quality assurance plans and procedures, calculations of public and private benefits and associated discussions, calculations of performance enhancements resulting from successful completion of proposed work, calculations of cost reductions resulting from successful completion of the proposed work effort, and copies of team publications

relevant to the proposed work. Any item submitted in an Appendix should begin with a summary of the relevance of that item to the proposal and the evaluation criterion to which it applies.

Volume 2 must contain the technical and cost information that responds to the Solicitation, and with the exception noted below, should be presented in the order listed below. There must be a Table of Contents, with page numbers for each section, and an executive summary before Section 1. The sections in Volume 2 are organized into two groups, Sections 1 through 5, and Sections 6 through 7.

The purpose of the first five sections is for the Applicant to provide a compelling narrative or “story” that justifies PIER funding of the proposed project. The Applicant should demonstrate a clear understanding of the state-of-the-art of the technology, the goals and objectives of the project, the niche filled by the proposed project in ongoing technical developments, the technical and economic feasibility and significance of the results to be derived from successful completion of the project, resource assessment, market needs and economics, the way in which these results will be accepted in the marketplace, and the public benefits to be derived by California electricity ratepayers. We have divided this “story” into the following topics:

1. Scientific and Technological Baseline
 - Resource Assessment and Sustainability of Feedstock Supply
 - Technical and Economic Feasibility Studies
2. Problem Statement
3. Project Goals and Objectives
4. Technical Approach and Probability of Success
5. Market-Connected Benefits of Successful Completion of the Project.

The boundaries among the above topics may be somewhat arbitrary. There is no need to repeat information from one topic to the next. If rearranging the order of two or three of the above topics helps to present your project in a logical fashion, then that is acceptable.

The second group of topics describes the specific details of the Applicant’s proposed RD&D project, and must be presented in the following numerical order:

6. Work Statement and Products, Due Dates and Gantt Chart
7. Project Costs, PIER Funding Request, Match Funding, the Need for PIER Funding and project budget forms

Below is a detailed description of the information the Applicant should present in the executive summary and Sections 1 through 7 of Volume 2.

Executive Summary (Attachment 3)

Prepare an Executive Summary of the project, no longer than two [2] pages, which describes in summary form:

- The problem, barrier, or deficiency, amenable to an RD&D solution, that the proposed ADT project will address in relationship to other current work in the field
- ADT technology or science being developed and advanced

- Type of biomass resources to be utilized in the proposed ADT and resource assessment
- Technical and economic feasibility studies
- Market needs and assessment
- The unique products, services, or levels of understanding that are expected to result from the project
- The technical approach and project steps that explain what will be done and how it will be done
- The quantitative goals and objectives of the project
- The overall project cost
- The amount of PIER funding being requested
- The amount, sources, and nature of match funding
- The types, estimated amounts, and timing of public benefits to be provided in California if the project is successful and if the results are incorporated into commercial products. California public benefits include, but are not limited to, the annual amount of energy to be saved, cost competitiveness, the amount of electrical power price reduction expected, reduction in environmental impacts, such as the tons per year of pollutants reduced, the installed capacity of ADT and prime movers in a specified future year, and/or the degree to which system reliability, dispatchability, maintainability, usability, flexibility, or power quality is enhanced.
- Estimated amounts of additional time and spending, if any, required to realize the public benefits that are being claimed for this project. Identify the types of entities that would be involved in these additional efforts.

Section 1. Scientific and Technological Baseline

Describe the scientific and technological baseline, that is, the current state-of-the-art or the developmental status of the subject technology to be advanced. Relate the developmental status of the subject technology to the performance of ADT and to the relevant performance targets and stretch goals in Section III, Table 1.

Identify entities engaged in development of the subject technology. If no one else is performing any related development work, state that explicitly. Identify whether or not the proposed project duplicates or overlaps with other ongoing RD&D.

Emphasize past advances that the Applicant's team has made in areas relevant to the proposed work. Describe Applicant's relevant work, accomplishments, failures, ongoing work, RD&D projects, funding levels, and funding sources. Be quantitative and rigorous in the discussion. List research papers, conference papers and presentations with full references, and summarize significant accomplishments that have been reported.

Within the technological baseline discussion, it may be advantageous for the Applicant to discuss the status of ADT in general in order to put the proposed work within the context of generating system development. The discussion could include factors such as developers and manufacturers, development status (whether laboratory scale, alpha testing, beta testing, commercially available), performance characteristics (efficiency, lifetime, emissions and other environmental characteristics including footprint and land requirement), manufacturing cost and selling price, and operation and maintenance costs.

Resource and market assessments and the technical and economic feasibility study of the proposed ADT should be included in this section. Resource assessment should include calculation and discussion of the sustainability of biomass resources that will be used for the proposed ADT project in a proposed location or site.

The scientific and technological baseline described here must facilitate the evaluation of the proposed RD&D effort. That is, there must be continuity between the current status of the subject technology and the proposed effort.

Section 2. Problem Statement

Describe the deficiencies that exist for the subject technology. The deficiencies should illuminate the question of *why* the proposed project should be done.

Identify and discuss the principal barriers, key unresolved issues, and knowledge gaps that hinder the development and widespread use of ADT in California that your proposal addresses. Barriers may be grouped under the following categories or other categories that the Applicant deems appropriate:

- Scientific and technological – such as insufficient scientific understanding of relevant biochemical phenomena and processes, inadequate materials, high cost of materials, poor durability, low reliability, low power density, low energy density, lack of detailed engineering designs and design trade-off analyses, inadequate component development, high cost of fabrication techniques, lack of automated manufacturing, insufficient field testing, or insufficient field demonstrations.
- Market – such as inadequate consumer knowledge or limited system supply and maintenance infrastructure. (Note: This Solicitation does not seek and will not fund proposals for market research, technical and economic feasibility study, resource assessment, consumer education, commercialization, or market conditioning activities.)
- Institutional – such as regulatory hurdles (e.g., atmospheric emission limitations, lack of tax incentives, etc.) or lack of adopted interconnection standards.
- Environmental – such as NO_x emissions above those set by Air Resources Boards or Districts within California, odors, excessive noise, or high water consumption.

Explain why these barriers have not been addressed by the marketplace or by other institutions.

Explain why the barriers should be addressed at this time. For example, place the proposed work into the context of the spectrum of barriers ADT systems face regarding widespread deployment and adoption. Discuss any perspectives on issues that are of particular importance and that are addressed by your proposal. Be succinct and as quantitative as possible.

Section 3. Project Goals and Objectives

At the beginning of this section, complete the following sentences. Please be succinct.

Overall Project Goal

The overall goal of this project is to...(Complete the sentence with a brief description of the goal(s). Goals can be technical, economic or social. Please be brief, two to three sentences maximum.)

This project meets the PIER Goal of <pick one from the list below> by <fill in the blank>. (If applicable, this project also meets the secondary goal of <pick one from the list below> by <fill in the blank>.)

PIER Goals

1. Improving the Energy Cost/Value of California's Electricity
2. Improving the Environmental and Public Health Costs/Risk of California's Electricity
3. Improving the Reliability/Quality of California's Electricity
4. Improving the Safety of California's Electricity

Technical and Economic Performance Objectives

The technical performance objectives of this project are to...(Complete this sentence with the technical objectives, which are things that will be measurable or knowable at the end of this project. Applicants should determine technical performance measures that are applicable to their projects).

The economic performance objectives of this project are to...(Complete this sentence with the economic objectives, which are things that will be measurable or knowable at the end of this project. Applicants should determine economic performance measures that are applicable to their projects).

Examples of Technical and Economic Performance Measures:

- . . .reduce the cost of electricity generation (or supply) by ____%.
- . . .increase the number of new technologies that are market-ready by ____<fill in the number>.
- . . . increase the adoption by the market of specific technologies by ____%.
- . . . increase the renewable technologies that are cost competitive by ____%.
- . . . increase the new energy systems that can use multiple fuels by ____%.
- . . . decrease end-use consumption in specific energy sectors.
- . . . decrease the ADT system impacts over current best practices by ____%.
- . . .increase the number of market-ready technologies that contribute to reduced risks of increased environmental/health impacts by ____<fill in the number>.

- . . .reduce the interruption frequency and duration per customer type per year by ____<fill in the number>.
- . . .increase the expected number of new technologies providing increased reliability/quality choices to consumers by ____<fill in the number>.
- . . .decrease the rates of injury and fatality associated with electricity generation/supply and usage by ____<fill in the number>.
- . . .determine the effectiveness of the XYZ process.

After completing the sentences above, discuss how and to what degree your proposed project contributes to realizing the targets and stretch goals, or other significant contributions leading to ADT improvement and market introduction and penetration in California. The targets and stretch goals for this solicitation is given in Section III, Table 1.

As a hypothetical example of meeting other significant goals, your project may not be able to reach a solicitation capital cost target of \$1250/kW_e for an ADT system by 2010, but your project may be able to reach a capital cost of \$1500/kW_e by 2005. If this higher capital cost is an improvement over the baseline technology, your project might offer public benefits equal to or greater than those offered by another proposed project that claims the ability to reach the hypothetical \$1250/kW_e cost target, but several years later.

Proposals for ADT projects must discuss any tradeoffs that must be made in achieving improvements in one performance parameter while compromising improvements in one or more other parameters. Certain proposals, such as those for advanced LFGTE materials and component development, may not be closely linked to the performance of a system. Such ADT proposals need not include the form; however, the proposal should state that the form is not applicable lest evaluators assume that the proposal is incomplete.

If your project is for combined heat and power system, identify the expected market applications. Discuss the match between the thermal and electrical outputs of the combined heat and power system with the load profiles of the expected end use sites. Describe the manner in which the waste heat will be utilized. Show the calculations for the expected First- and Second-Law efficiencies.

List and describe the technical or economic performance goals (improvements in technology or the state of knowledge that can be measured and quantified) for your proposed project. Your goals must be quantitative, verifiable and measurable by physical observation or testing. If the improvements that your project will make are not amenable to measurement, surrogate performance metrics that can be measured must be given. Describe the methodology or procedure that will be used at the completion of the project to determine if the goals or performance metrics have been achieved.

List and describe the technical or economic objectives—desired conditions outside the project itself that will result from the success of the project.

Section 4. Technical Approach and Probability of Success

Explain how the proposed work extends or complements prior RD&D. That is, continue the discussion given under “Scientific and Technological Baseline.” Explain how and why the proposed RD&D are the next and necessary step.

Succinctly state the specific advances in science and technology that the proposed project will achieve, if successful.

Show how a successful project will make a significant difference in the status of the subject technology. Explain the manner in which, and the degree to which (be quantitative), the proposed effort will address and resolve the principal barriers, issues, and knowledge gaps described in the Problem Statement.

Describe any proprietary market or technical information—not currently under your control or to be developed as part of this project—which will be necessary to complete the project. If such information is necessary, describe how it will be obtained. Describe any unresolved intellectual property issues.

Describe the level of risk associated with the project. Discuss the probability that the project will achieve its goals and objectives and that science and technology will be advanced. Discuss the technical viability of the proposed effort.

After answering the previous questions in this section, describe your technical approach. For the project as a whole and for each technical task, present the nature of the work that will be done, the underlying technical considerations, and the technical merit of the proposed project. Explain how scientific and engineering principles will be applied in order to achieve the proposed project’s objectives and goals. Identify and describe any innovative or distinctive features of the approach. Explain why any innovative approach is expected to be more successful than prior approaches. Assess risks or potential problems that could prevent the task from being completed on time and on budget. Please use the following format, which parallels the task listings in the work statement. This is the place for the detail behind and the rationale for your proposed activities. In contrast, the work statement is the place for the essential elements of the process you will use to complete the project.

Technical Approach

Overview

Task 2.1 (*Name*)

Task 2.2 (*Name*)

Task 2.3 – 2.n (*Name*)

Section 5. Market-Connected Benefits of Successful Completion of the Project

A key objective of the PIER program is to develop energy products or services that are connected to the market, that is, those that will be installed so that they can produce public benefits for California’s electricity ratepayers. Through this solicitation, the Energy Commission is seeking worthy, fully integrated, state of the art, almost market-ready ADT for distributed generation applications capable of providing immediate market-connected benefits to California’s electricity ratepayers.

Your discussion of market connected benefits should be limited to less than two pages; we are not requesting an exhaustive market study. However, if a market study already exists, which is a pre-requisite to this solicitation, and is particularly relevant, please provide its reference.

Describe the expected outcomes—the effects on ADT stakeholder communities—if your proposed ADT RD&D project is successful. Identify the beneficiaries and users of the scientific or technological knowledge expected to be gained.

Assume that your project is successful. Describe a plausible scenario leading to commercial introduction of an economically viable ADT generating system. Estimate the time and expense required reaching this point. Estimate the timeframe under which the economic benefits will accrue. Describe any additional activities, beyond those in the Work Statement, that must be taken to achieve these benefits. State any assumptions made in estimating the benefits, and justify the bases for the assumptions.

This discussion should:

- (1) Identify the specific market(s) for products or services resulting from the RD&D efforts,
- (2) Estimate the size of that market, and how much of that market exists in California,
- (3) Provide an overview of the pathway(s) by which such products or services will ultimately enter the marketplace,
- (4) Identify infrastructure changes necessary for commercialization including changes to regulations (environmental, safety, permitting),
- (5) Identify people or entities that can aid in facilitating market entry, and
- (6) Describe important incentives these entities will have to commercialize the product.

Demonstration projects should be closely connected to the market, while fundamental research projects may have a less quantifiable market connection and less likelihood to provide immediate market-benefits. If your project is for a demonstration or test of a complete ADT electricity generating system, clearly identify the market segments (agricultural, residential, commercial, industrial by SIC codes) and service (ancillary services, baseload, peaking, back-up) being targeted. Discuss the match between the output and duty cycle of the generating system and the host load.

Based on the market(s) that you believe will use the results your successful project, estimate the public and private benefits that will accrue. Categories of benefits include but are not limited to, improved emissions, improved fuel conversion efficiency, reduced cost of manufacturing, and more reliable and durable components. The benefits must derive from the project objectives and goals and be limited to the markets you expect to reach.

Distinguish between the public benefits (especially those to the California electricity ratepayer) of the proposed project, and the private benefits, including those to the Applicant. Apportion benefits between the public and private sectors. Compelling arguments justifying the apportionment should be made if most of the benefits are claimed to be public.

Describe any expected ideas, which will have potential patent application.

Note that effective January 1, 2003, all distributed (electricity) generation technologies in California shall be either (1) certified for use by the California Air Resources Board (CARB) and exempted from district permitting requirements, or (2) permitted by a district. Emissions shall be made equivalent to the level determined by CARB to be the best available control technology for permitted central station power plants in California. (SB 1298 [Bowen], Health and Safety Code Sections 41514.9 and 41514.10). If your project results will not meet these emission requirements, discuss why non-conformance of the system being developed is appropriate. Up-to-date and specific details on CARB's implementation of SB 1298 can be found at <http://www.arb.ca.gov/dg>.

Section 6. Work Statement, Products, Due Dates and Gantt Chart

Applicant should follow the prescribed work statement format in this solicitation. The Work Statement shall:

- Be consistent with the proposal's problem statement, objectives, goals and technical approach.
- Contain appropriate detail and clarity to be incorporated directly into a grant agreement.
- Contain a logical sequence of tasks.
- Contain a schedule.

Sequence of Tasks

This shall include:

- A description of each task in the order in which you expect the work to be done. Instructions and examples are shown below, and the work statement template is contained in the Application Manual Attachment 5 (Grant Exhibit A).
- If your project is for a demonstration, or if your project involves testing, one of the tasks should be Test Plan preparation. The Test Plan should include considerations such as the number of hours of operation, the thermal cycling schedule, the type of monitoring to be performed, the manner in which data will be analyzed and reported, and a Quality Control and Quality Assurance Plan to assure data validity. A Critical Project Review generally will be conducted at the conclusion of this task and prior to hardware testing.
- If your project is for a demonstration and if the demonstration is to be grid-connected, or will develop hardware for grid-connected applications, discuss the degree to which the demonstration will comply with both Supplemental Recommendation Regarding Distributed Generation Interconnection Rules P700-00-014, and Distributed Resources Interconnected with Electric Power Systems, Institute of Electrical and Electronics Engineers (IEEE) Publication P1547 (available at www.ieeeusa.org).
- If your project is for the pre-commercial demonstration of a generating system, pre-installation system testing by the manufacturer or system integrator should be one of the tasks.

- A Technology Transfer Plan. The objective of the plan is to make the knowledge gained, experimental results, and lessons learned readily available to decision-makers. The plan must explain how the products from the other tasks will be distributed and how it will be made available to the public. The level of detail expected is least for research-related projects and highest for demonstration projects.
- A Production Readiness Plan, if applicable. Projects that will lead to the mass manufacturing of developed hardware within the next five years should also include a task addressing production readiness. The Production Readiness Plan should consider the following:
 - Identification of critical production processes, equipment, facilities, personnel resources, and support systems that will be needed to produce a commercially viable product.
 - Internal manufacturing facilities, as well as supplier technologies, capacity constraints imposed by the design under consideration, identification of design critical elements and the use of hazardous or non-recyclable materials. The product manufacturing effort may include “proof of production processes”.
 - A projected “should cost” for the product when in production.
 - The expected investment threshold to launch the commercial product.
 - An implementation plan to ramp up to full production.

The degree of detail in the Production Readiness Plan discussion should be proportional to the complexity of producing the proposed product and its state of development. Applicants who wish to use PIER funds to optimize more complex production manufacturing processes, or have manufacturing processes closer to being market ready, will be expected to provide a higher degree of detail on the manufacturing process than applicants whose manufacturing process is relatively simple or relatively far from being market ready.

The work effort should be divided into a series of logical, discrete and sequential tasks. Technical tasks start with the number 2.1. Applicants must use the following pattern for each technical task.

Task 2.1 Task Name

The goal of this task is to . . .

Successful completion of this task will be measured by . . .

This goal helps to achieve the project objectives by. . .

The Recipient shall:

- Active verb . . .
- Active verb . . .

Products:

- 1st Product
- 2nd Product

Key Personnel:

Key Subcontractors:

Task 2.2 – 2.n-2

(Repeat the process as shown above)

Task 2.n-1 Technology Transfer Activities (*See Application Manual Attachment 5. Work Statement.*)

Task 2.n Production Readiness Plan (*See Application Manual Attachment 5. Work Statement.*)

Description of the Contents for Each Section:

Task 2.1 (*Insert Task Name*)

The goal of this task is to . . . (*Complete the sentence by inserting a brief description that identifies the expected result(s) and accomplishments for this task. The description should be 2 to 3 sentences maximum. Use a consistent naming convention throughout the work statement. For example, the name “direct combustion system” is not the same as the name “thermal gasification.” Pick one name and stick with it throughout.*)

Successful completion of this task will be measured by... (*Complete the sentence by listing the performance measure(s) or other criteria that will be used to evaluate the results and to determine to what degree the goal was achieved.*)

Meeting this goal helps to achieve the project objectives by... (*Complete the sentence.*)

The Recipient shall:

- (*Insert verb in active tense*) . . . (*Complete the sentence.*)
- (*Insert verb in active tense*) . . . (*Complete the sentence.*)

(*List each individual activity with a separate bullet and begin each bullet with a verb to continue the sentence beginning with "The Recipient shall." Organize activities in the order in which they will occur. A bullet needs to appear before each activity. Use this section to describe the essential elements of the process you will use to complete the project. In contrast, the Technical Approach Section in your proposal is the place for the detail behind and the rationale for your proposed activities.*)

The contents of each product shall also be described in this section. Only the names of each product shall appear in the “Products” section. Use exactly the same name to identify a product (report, data set, project plan, etc.) in the activity and in the list of products. See List of Different Types of Technical Products for example language for each type of product. A bullet needs to appear before each product.

Products are deliverables that incorporate the knowledge and understanding gained by performing the activities and that are submitted to the Commission for review, comment and approval. Products include, but are not limited to, written reports that describe methods, test plans, results of testing, analysis of data, conclusions, and recommendations for future study, workshop agendas and summaries, description and photographs of equipment/product developed, summaries of advisory group meetings, computer software with written instructions for data input and use of the software, if intended for public or Commission use, and production prototypes. The sum of the products should be sufficiently detailed to be of use to stakeholders and other researchers. The level of detail should be sufficient for an observer to assess whether the project objectives and goals have been successfully met.

Products:

- 1st product (name only)
- 2nd product (name only)

(List products using the same name and in the order that they appear in “The Recipient shall” section. Only the product name should be listed here. The contents of each product shall be described in “The Recipient shall” section.)

Key Personnel:

- John Doe

(Name of key person for this task that works for the prime recipient. If none, state none.)

Key Subcontractors:

- Valiant Energy Systems
- Bio Enthusiast, ReGen Systems

(Name of key company or name of key person at key company for this task. If none, state none.)

List of Different Types of Technical Products *(These are examples, which you may modify for use in your project. You may create other products as needed, but please adhere to the patterns shown.)*

1. Notification Letters

- Provide a Notification Letter regarding _____, to the Commission Project Manager. *(Give it a unique name based on the content and the project.)* The letter shall include but not be limited to written documentation that the _____ is ready for *(testing, viewing, submission for certification, etc.)* and the date such *(testing, viewing, submission for certification, etc.)* shall begin, and shall include photographs.

Products:

- Notification Letter regarding _____

2. Test Plans

- Prepare the draft _____ Test Plan. (*Give it a unique name, such as the Project Title Test Plan. Test plans and testing procedures should be described in detail including factors such as instrumentation, data collection, data analysis, statistical analyses, and performance curves. Test results shall include relationships among performance, efficiency, emissions, temperature, pressure and all other parameters that qualify and quantify the subject technology*). The draft test plan shall include, but not be limited to:
 - a description of the process to be tested
 - the rationale for why the tests are required
 - predicted performance based on calculations or other analyses
 - test objectives and technical approach
 - a test matrix showing the number of test conditions and replicated runs
 - a description of the facilities, equipment, instrumentation required to conduct the tests
 - a description of test procedures, including parameters to be controlled and how they will be controlled; parameters to be measured and instrumentation to measure them; calibration procedures to be used; recommended calibration interval; and maintenance of the test log
 - a description of the data analysis procedures
 - a description of quality assurance procedures
 - contingency measures to be considered if the test objectives are not met
- Submit the draft test plan to the Commission Project Manager for review and comment. Once agreement on the draft test plan has been reached, the final test plan shall be submitted to the Commission Project Manager for written approval, which shall be provided within 10 working days of receipt of the final test plan. Key elements from the test plan shall be included in the Final Report for this project.

Products:

- Draft _____ Test Plan
- Final _____ Test Plan

3. Interim Reports (*This applies to all reports. Examples include task and subtask reports, test reports, data sets, databases and computer model development or application. Monthly reports and the final report are treated separately as shown in the Work Statement.*)

- Prepare the draft _____ Report (*Give it a unique name, such as the ABC Test Report or 123 Database. If an interim report is based on earlier work in this project, then the titles should relate to each other. After the title insert a description of the product.*) This report shall include, but not be limited to, the following: (*List the elements of the report in separate bullets.*)

For example, if the Interim Report is a Test Report, use the following description:

The Test Report shall include, but not be limited to, the following:

- the test plan
- test results
- analysis
- conclusions
- recommendations
- photographs as appropriate.
- (add additional bullets specific to the project)

For example, if the Interim Report is a Task or Subtask Report, use the following description:

The Task or Subtask Report shall include, but not be limited to, the following:

- the goal of the task or subtask;
- the description of the approach used;
- list of activities performed;
- description of the results and to what degree the goal was achieved;
- significant issues encountered and how they were addressed;
- a discussion of the implications regarding the success or failure of the results, and the effect on the budget and the overall objectives of the project.
- photographs as appropriate.
- (add additional bullets specific to the project)

Submit this draft _____Report to the Commission Project Manager for review and comment. Once agreement on this draft report has been reached, the final version shall be submitted to the Commission Project Manager for written approval, which shall be provided within 5 working days of receipt of the final version. Key elements from the final version of this report shall be included in the Final Report for this project.

Products:

- Draft _____ Test (Task, Database, etc.) Report
- Final _____ Test (Task, Database, etc.) Report

4. Use this pattern for reports that will be discussed at a Critical Project Review.

- Prepare the Draft _____(Report, Test Plan, etc). This document shall be submitted to the Commission Project Manager for review at least 15 working days prior to the (first, second, etc) Critical Project Review. This document will be one of the main topics for discussion at the Critical Project Review. This document shall include, but not be limited to the following: (Insert the appropriate bulleted items for either Test Plans in number 2 above or Reports in number 3 above.)

- Participate in the (1st, 2nd, etc) Critical Project Review.
- Modify this draft document in accordance with comments received during the Critical Project Review. The final version of this document shall be submitted to the Commission Project Manager within 10 working days after the Critical Project Review. The Commission Project Manager shall send written notification of approval to the Recipient within 10 working days after receipt. Key elements from this document shall be included in the Final Report for this project.

Products:

- Draft _____ (Report, Test Plan, etc)
- Final _____ (Report, Test Plan, etc)

5. Bills of Materials or Equipment Lists

- Prepare a Bill of Materials (or Equipment List) for _____.
(Give it a unique name.) This document shall include but not be limited to:
 - a description of each item
 - test protocols and codes applicable to each item
 - cost estimates or bids for each item

Products:

- Bill of Materials (or Equipment List) for _____

Examples of Technical Task Descriptions

Example 1 (Note the Critical Project Review.)

Task 2.1 – Identification of Analysis Parameters and Required Data Layers

The goal of this task is to finalize the specific data variables and ranking methodologies needed for the project.

Successful completion of this task will be measured by having an approved ranking methodology.

Meeting this goal helps to achieve the project objectives by providing the ranking methodology that will be used for the remainder of this project.

The Recipient shall:

- Attend meetings to identify, prioritize and rank factors associated with identifying strategic locations for installing renewable distributed generation systems:
 - Electricity system conditions (T&D hot spot identification and performance characteristics)
 - Renewable resource availability and amounts
 - Environmental characteristics (e.g., air quality conditions, landfill capacities, etc.)

- Socioeconomic characteristics (e.g., unemployment, number of small businesses, etc.)
- Energy use information for large energy users
- Other public benefit information (e.g., high-risk wildfire areas, etc.)
- Prepare the draft Methodology for Ranking and Manipulating Data Report. This document shall be submitted to the Commission Project Manager for review at least 15 working days prior to the first Critical Project Review. This document will be one of the main topics for discussion at the Critical Project Review during which the Commission Project Manager and the Recipient may decide to identify additional data development or analysis parameters to meet objectives of this grant. This document shall include, but not be limited to the following:
 - the goal of the task or subtask;
 - the description of the approach used;
 - list of activities performed;
 - description of the results and to what degree the goal was achieved;
 - significant issues encountered and how they were addressed;
 - a discussion of the implications regarding the success or failure of the results, and the effect on the budget and the overall objectives of the project.
 - photographs as appropriate.
- Participate in the Critical Project Review.
- Modify this draft document in accordance with comments received during the Critical Project Review. The final version of this document shall be submitted to the Commission Project Manager within 10 working days after the Critical Project Review. The Commission Project Manager shall send written notification of approval to the Recipient within 10 working days after receipt. Key elements from this document shall be included in the Final Report for this project.

Products:

- Draft Methodology for Ranking and Manipulating Data Report
- Final Methodology for Ranking and Manipulating Data Report

Key Personnel:

- Peter Biogason

Key Subcontractors:

- Valiant Energy Systems

Example 2 (Note the subtask numbering convention.)

Subtask 2.3.5. Comparison of Distributed Generation Option with Conventional T&D System Solutions, and Develop Overall Conclusions and Recommendations

The goal of this subtask is to compare the potential T&D system benefits to be gained from using the evaluated DG technologies.

Successful completion of this task will be measured by having a report that compares the system benefits and by having a spreadsheet that enables manipulation of the comparison variables.

Meeting this goal helps to achieve the project objectives by providing the basis for making the recommendations in the final report.

The Recipient shall:

- Prepare the draft Methodology and Assumptions Comparison Report. This shall include, but not be limited to, the following:
 - the goal of the task or subtask;
 - the description of the approach used;
 - list of activities performed;
 - description of the results and to what degree the goal was achieved;
 - significant issues encountered and how they were addressed;
 - a discussion of the implications regarding the success or failure of the results, and the effect on the budget and the overall objectives of the project;
 - photographs as appropriate;
 - an estimation of the impacts of DG on T&D system reliability, capacity, deferral or avoidance of system upgrades and power quality. The method developed will be specific to the DG system size and the type of T&D system issue in the hot spots evaluated in the task above.
 - evaluation of the T&D system variables including system reliability, capacity, deferral or avoidance of system upgrades and replacement and power quality.
- Submit the draft Methodology and Assumptions Comparison Report for review and comment. Once agreement on this draft report has been reached, the final version shall be submitted to the Commission Project Manager for written approval, which shall be provided within 10 working days of receipt of the final version. Key elements from the final version of this report shall be included in the Final Report for this project.
- Prepare the draft Renewable Conventional Comparison Spreadsheet Report. This report shall include, but not be limited to, the following:
 - the goal of the task or subtask;
 - the description of the approach used;
 - list of activities performed;
 - description of the results and to what degree the goal was achieved;
 - significant issues encountered and how they were addressed;
 - a discussion of the implications regarding the success or failure of the results, and the effect on the budget and the overall objectives of the project;
 - photographs as appropriate;

- a comparison of the economics of deploying renewable DG technology with conventional solutions to the T&D problems. This step will involve creating a spreadsheet to compare the economic, public and T&D system costs and benefits of specific DG applications with those of T&D system upgrades and replacements.
- Submit the draft Renewable Conventional Comparison Spreadsheet Report to the Commission Project Manager for review and comment. Once agreement on this draft report has been reached, the final version shall be submitted to the Commission Project Manager for written approval, which shall be provided within 10 working days of receipt of the final version. Key elements from the final version of this report shall be included in the Final Report for this project.

Products:

- Draft Methodology and Assumptions Comparison Report
- Final Methodology and Assumptions Comparison Report
- Draft Renewable Conventional Comparison Spreadsheet Report
- Final Renewable Conventional Comparison Spreadsheet Report

Key Personnel:

- Edilbert Landbert

Key Subcontractors:

- Eli Cooper

Products, Due Dates and Gantt Chart

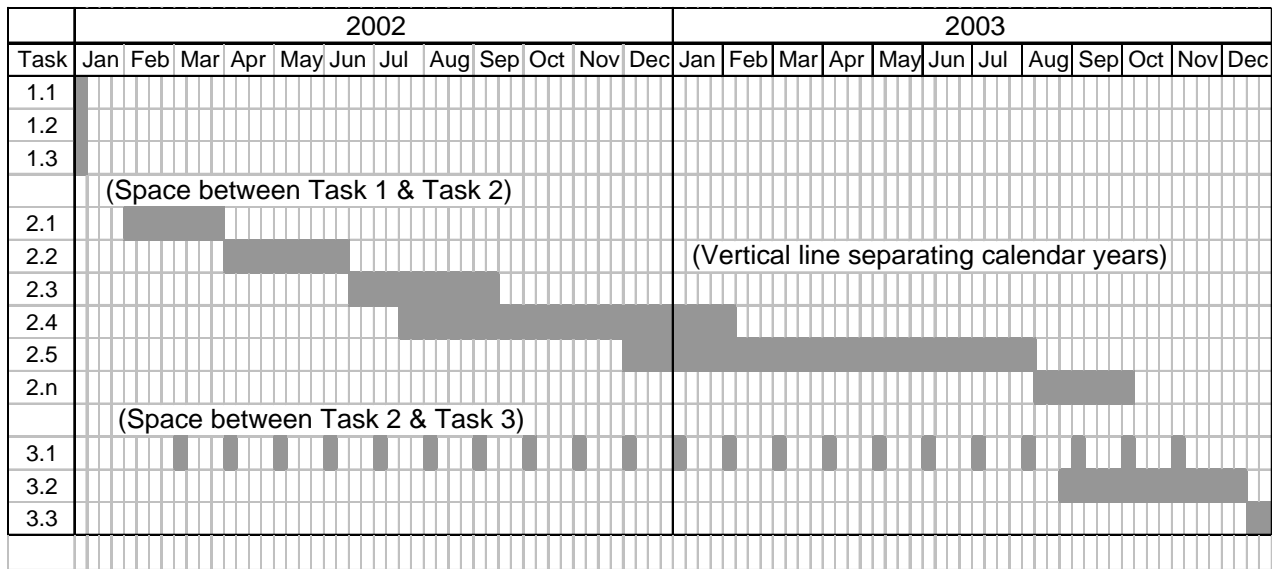
Complete Application Manual Attachment 8 (Grant Exhibit B), Products, Due Dates and Gantt Chart. This attachment contains two spreadsheets: 1) Products and 2) a Gantt chart. Enter all of your task numbers first, then enter task names. Entering information in this manner will properly link the spreadsheets. Next, enter the products in the order they appear in the Application Manual Attachment 5, Work Statement, using the list of products from each task. Use one line for each product. Note that the spreadsheet contains Critical Project Reviews shown as examples in two tasks. Put the Critical Project Reviews where they belong in your project. Products that will be discussed at the Critical Project Review should appear before the Critical Project Review and their final versions should appear after.

Name of Company or Organization				
Task Number	Task Name	Product(s)	Planned Start Date	Planned Completion Date
1.0	Project Start-Up Tasks			
1.1	Attend Kick-off Meeting	Kick-Off Meeting		
1.2	Document Match Funding	Cash/In-kind lists, commitment letters		
1.3	Identify and Obtain Permits	Permit plan or no permits required letter		
2.0	Technical Tasks			
2.1	Name of Task 2.1	Name of Product for Task 2.1		
2.2	Name of Task 2.2	Name of Product for Task 2.2		
2.3	Name of Task 2.3	Draft of Product for Task 2.3		
	Critical Project Review			
		Final of Product for Task 2.3		
2.4	Name of Task 2.4	Name of Product for Task 2.4		
2.5	Name of Task 2.5	Name of Product for Task 2.5		
2.6	Name of Task 2.6	Name of Product for Task 2.6		
2.7	Name of Task 2.7	Draft of Product for Task 2.7		
	Critical Project Review			
		Final of Product for Task 2.7		
2.8	Name of Task 2.8	Name of Product for Task 2.8		
2.9	Name of Task 2.9	Name of Product for Task 2.9		
2.10	Name of Task 2.10	Name of Product for Task 2.10		
3.0	Reporting Tasks			
3.1	Monthly Progress Reports	Monthly Progress Reports		
3.2	Final Report			
3.2.1	Final Report Outline	Final Report Outline		
3.2.2	Draft Final Report	Draft Final Report		
3.2.3	Final Report	Final Report		
3.3	Final Meeting	Meeting Participation		
		Written Documentation of Meeting Agreements		

The second spreadsheet contains a Gantt Chart, showing the overall summary of the project schedule. The purpose of the Gantt chart is to visually display the time frames of the tasks in this project. Each chart shall contain the following common characteristics:

- The task numbers in the first column will be transferred automatically to the Gantt Chart so you do not need to enter them.
- Maintain blank rows between Task 1, Task 2 and Task 3.
- Modify the years to meet the time frame for your project. The template contains 4 years. You may add more if needed. Each calendar year is separated with a vertical line.
- The months are set up in 1/4-month increments so that your schedule can be accurate to the nearest week.
- Select the beginning month and year based on the expected start date for your project given the schedule for this Solicitation. Select the end-date based on the schedule for your project
- Task 1 and Task 3 contain the correct number of tasks. You may add or delete rows as needed in Task 2.
- Shade the areas representing the time frame for each task. The shading has been preset at gray 40%.
- The chart has been preset to print as a single landscape sheet.

An example Gantt Chart follows:



Note: It does not matter whether the Gantt Chart is created in Microsoft Excel or Microsoft Project. However, it must fit on one 8 1/2 x 11 page.

Section 7. Project Costs

In a narrative but quantitative and definitive manner, discuss:

- The appropriateness of the total project cost considering the scope of work and the relevant expertise of the Project Team.
- The appropriateness of the amount of PIER funding requested for the project considering the anticipated absolute and proportional public benefits to California electric ratepayers.
- The amount of match funding that will be brought to this project. Discuss the appropriateness of the level of match funding considering the estimated and anticipated level of private benefits. Describe the nature of the match funding being offered by the Applicant and subcontractors.
- Why PIER funding for the project is required—that is, why this project cannot be funded within competitive or regulated markets. Potentially valid reasons for PIER funding include high risk/reward concerns, high financial cost, or the non-exclusive nature of the project results, which would result in financial gain for others rather than for the Applicant. Defend your reason.

Projects whose results are more likely to lead to products and services that can be commercialized in the near future will generally need a higher percentage of matching funds than projects whose results are further removed in time from commercialization.

Describe any extra value that the Applicant provides. For example, concisely explain how previous and current work by the Applicant, patents and patent applications, proprietary information, databases, unique facilities, specialized equipment, or specialized expertise will be leveraged into the proposed work.

Acceptable and Non-Acceptable Sources of Match Funding

Discuss the sources of match funding. For example, applicant and/or team members, project partners, investors, lenders, equipment manufacturers, utilities, universities, government entities or others. Discuss whether match funding is in cash or in-kind services. In-kind contributions include donated labor hours, equipment or facilities.

If the match funding comes from a related project, describe the related project in detail. Distinguish between the scope of work for this proposal and the scope of work for the related project.

Staff time, laboratory space, equipment, and most property can count as match funds if they are fully dedicated to the project for the time the property or equipment is required by the agreement, and if the value of the contribution is based on documented market values or book values and is depreciated or amortized over the term of the project using generally accepted accounting practices.

Property and equipment that do not qualify as match funds include such items as standard office supplies and property or equipment that is part of the applicant's normal business activity (desks, typewriters, telephones, computers, software, etc.).

In all cases, the Commission reserves the right to review and approve or disapprove the crediting of contributions and the amounts of those contributions as match funding.

Prior investments in the project do not qualify as match funds. Funding from other Commission projects or contracts does not qualify as match funding. The sources and amounts of match funding must be identified in the applicant's budget.

Proposed match funding must be spent concurrently with PIER Program funds, and only on the project elements described in the proposal. Match funds can be spent once the Commission has approved an awarded grant at a scheduled Business Meeting. However, PIER funds cannot be spent until the grant agreement is fully executed.

Project Budget Forms

The Recipient and major subcontractors must submit information on all the budget forms described in Attachment 9. *(For purposes of this Solicitation, a "major" subcontractor is one that is requesting \$100,000 or more of PIER funds. "Minor" subcontractors, i.e., those requesting less than \$100,000 of PIER funds, do not need to provide detailed budget forms and spreadsheets.)*

Instructions for personnel hourly rates, benefits, calculation of rates, detailed budget for each task, and sample budget can be found in Attachment 9.

What can I put in Volume 3 – Confidential Information?

Applicants are discouraged from submitting any confidential information regarding their proposed project under this solicitation. However, if the applicant believes that certain confidential information would be important for the scoring committee to consider, or

would clarify the status of the development of the technology prior to any awarded grant (i.e., benchmarking for royalty purposes), applicants may submit such specifically requested and identified confidential information as a separate volume to the Commission. Include at the beginning of this volume the Confidential and Pre-existing Intellectual Property form, Solicitation Attachment 10.

The Confidential Volume 3 must be packaged and sealed separately from the non-confidential Volumes 1 and 2. Volume 3 must accompany Volumes 1 and 2, must be clearly marked “Confidential Information for Targeted Biomass Solicitation for Biogas Systems or Anaerobic Digestion technologies”, and must include the applicant’s name and the project title. The Commission in accordance with the confidentiality regulations contained in Title 20, California Code of Regulations, Sections 2501-2505, will determine confidentiality.

The Commission will not accept or retain any proposals that are submitted entirely in confidence. However, all proposals will be kept confidential until the Notice of Proposed Awards is posted.

What Types of Information Are Considered Confidential?

Consistent with its confidentiality regulations, and the California Public Records Act (Government Code Section 6250 et. seq.), the Commission generally will grant confidential treatment for information that is essential to understanding the proposal, clarifies the status of technology prior to project work, or will be a product. Examples include:

- Any information that is patent pending (until a patent has been approved), including patent application numbers
- Technical trade secrets (e.g., detailed technical drawings)
- Marketing/business trade secrets (e.g., energy use data for an individual commercial or industrial facility, pending strategic partnerships with manufacturers)
- Economic/financial trade secrets (e.g., income tax records).

Conversely, the Commission generally will not allow confidential treatment for certain other types of information. Applicants are cautioned against seeking confidentiality for the following types of information:

- Project descriptions/work statements (including task descriptions, schedule of products and due dates)
- Proposed project budgets (PIER and match fund), including labor rates
- Names of employees, subcontractors and match fund participants
- Test plans and reports
- Progress reports
- Final reports.

The Commission will allow technical and business trade secrets to be reported in separate confidential addenda to test reports and final reports.

C. Questions Related to Evaluation Process and Scoring Criteria

This section explains the overall evaluation process and the technical and policy evaluation criteria. It describes how the proposals will be evaluated for completeness, eligibility and fundamental scientific feasibility. It also describes the evaluation stages, and scoring of all proposals.

The entire evaluation process from receipt of proposals to the posting of the Notice of Proposed Award is confidential.

An Applicant's proposal will be evaluated and scored based on its response to the information requested in this solicitation. During the evaluation and selection process, the Commission may interview applicants either by telephone or in person at the Commission, and/or conduct a site visit at the applicant's facilities for the purpose of clarification and verification of information provided in the proposal. However, these interviews may not be used to change or add to the contents of the original proposal.

What is the Proposal Screening Process?

Administrative, Completeness, Eligibility, and Feasibility Screening

All proposals will be initially screened for administrative, completeness, eligibility, and fundamental scientific feasibility. Proposals that fail the administrative, completeness, eligibility, and feasibility screening will not be evaluated further under this solicitation.

1. Administrative Screening

If your proposal fails any of these items, it will be rejected immediately:

- The proposal must be received at the California Energy Commission Grants and Loans Office by the time and date indicated in Section III.
- The proposal must not be marked confidential in its entirety. Proposals that are marked confidential in their entirety will be rejected from further evaluation under this solicitation.

2. Completeness Screening

A proposal must include the contents described in Section III B, Application Manual Attachments and Forms or the proposal will fail the completeness screening and will be rejected prior to the technical evaluations. In particular, proposals will be screened for completeness on the basis of whether or not the proposal contains sufficient information to enable a useful evaluation to be conducted.

3. Eligibility Screening

To be eligible for possible funding under this ADT solicitation, proposed projects must meet all of the following eligibility criteria:

- The project must address one of the focus areas identified in Table 1 of Section III.

- The project must contain a discussion that clearly identifies how the proposed ADT-related RD&D activities will advance science or technology not adequately provided by the competitive and regulated markets.
- Each proposal must be limited to a single, specific project. Individual proposals that request funding for multiple projects are not eligible for this solicitation, and will be rejected from further evaluation. The Commission has full discretion to determine whether a proposal is for a “project” (and therefore eligible for this solicitation) or a “program” (and therefore not eligible for this solicitation). An applicant may submit separate proposals for different projects.
- The Applicant must not be a party to any claim or lawsuit alleging breach of contract, misrepresentation, and/or fraud and must be free of all liens or judgements that clearly jeopardize completion of the project.

4. Feasibility Screening

Proposals will be evaluated for fundamental feasibility on the basis of whether the proposed project appears to comply with known scientific principles, and if not, whether the proposal contains a sufficiently sound explanation to justify proceeding with a further evaluation.

How will Proposals be scored?

Overview of the Evaluation Scoring Process

All proposals that pass the Completeness, Eligibility and Feasibility Screening will be further evaluated and scored for merit. The Commission may use Commission staff, staff of other agencies, private consultants or other designated representatives of the State to evaluate the proposals. All proposal evaluators and scorers will keep the contents of the proposals confidential. Both the technical and policy merits of each proposal will be evaluated.

A Commission Scoring Committee will evaluate and score proposals according to the evaluation criteria below. Eligible proposals will be ranked in descending order based upon total score. All proposals receiving a weighted score of ninety (90) points or more will be considered for possible funding. The Commission’s RD&D Policy Committee will recommend how far down the ranked list of proposals scoring ninety (90) points or higher that will receive awards. The Committee’s recommendations are presented at a Commission Business Meeting and can be approved as recommended, or the Commission can adjust the cut-off lines higher or lower in the ranking.

Projects above the Commission’s adopted cut-off line cannot be “skipped-over” for funding. That is, a project with a higher score cannot be rejected while a project with a lower score is funded. Projects that fall below the Commission’s adopted cut-off line will not be funded at this time.

If a successful applicant decides to withdraw a proposal, or if applicant will not sign a proposed agreement within the allotted time, the project can be disqualified from this award and the next highest-ranked project may be funded instead.

The Scoring Committee will give a score from zero to ten for each criterion described below, based upon the information provided by the applicant's proposal. Each score will then be multiplied by a weighting factor to obtain the total points for that criterion. Scores will be assigned in accordance with the following guidelines:

<u>Score</u>	<u>Proposal Response</u>
0	Not Responsive to the criterion
1 - 2	Response is Minimal
3 - 4	Responds only Marginally to relevant considerations under the criterion
5 - 6	Responds Satisfactorily to Most relevant considerations under the criterion
7 - 8	Responds Satisfactorily to All relevant considerations under the criterion
9	Responds Completely, Accurately and Convincingly to All relevant considerations under the criterion
10	Response is Complete, Specific and Superior, both quantitatively and qualitatively

What are the Technical and Policy Evaluation Criteria?

All proposals that pass the Completeness, Eligibility and Feasibility screening will be evaluated for merit based on the following technical and policy evaluation criteria:

1. The proposal accurately and completely describes the Scientific and Technological Baseline.

Weighting Factor: 1.0 Possible Points: 10

The proposal completely and accurately describes the current status of the ADT to be improved by the proposed effort, including the relationship of the subject technology to the relevant performance targets in Section I.

The applicant describes in detail, with substantiation, its past and current work in the subject technology. Accomplishments (not just activities), successes and failures are described.

Substantiation of biomass resources to be used, types, availability, characteristics and sustainability should be well documented. Results of the technical and economic feasibility studies are well described with backup documentation.

The Scientific and Technological Baseline description is in sufficient detail to determine where the proposed effort fits in the continuum of scientific and technological development.

2. The proposal identifies Barriers, Issues, or Knowledge Gaps Amenable to RD&D solutions.

Weighting Factor: 1.0 Possible Points: 10

The proposal clearly identifies, describes and quantifies the significance of barriers, issues and knowledge gaps faced by ADT systems that the proposed project will address.

The proposal identifies and describes the nature and relevance of scientific or technological deficiencies.

The barriers are directly relevant and important to the development of ADT in California.

The proposal explains why these issues have not been addressed to date.

The proposal explains why resolving these barriers are appropriate now. Of the spectrum of issues, these particular issues are most timely.

3. The project's objectives and goals have the potential to fulfill the Solicitation's Targets and Stretch Goals.

Weighting Factor: 1.0 Possible Points: 10

The proposal lists and describes quantitative or measurable technical performance goals, and relates these to the relevant ADT Targets in Section III, Table 1.

For ADT projects, the applicant has provided target Performance Characteristics of proposed ADT showing expected values of the key parameters for a generating system resulting from the proposed project and for the commercial product. Tradeoffs among the performance parameters are clearly discussed.

The proposal lists and describes clear, significant, and quantifiable technical and economic objectives.

The methodology to be used to determine if the project objectives and goals have been achieved is fully described.

4. The Applicant's Technical Approach and Probability of Success is fully explained and provides a convincing expectation of significant technical results.

Weighting Factor: 1.0 Possible Points: 10

The proposal describes the scientific and technical principles underlying the proposed ADT work effort and the manner in which the scientific and engineering principles will be applied.

The specific expected advancements in science or technology is well described.

The proposal explains how and why the proposed project is the necessary next RD&D step.

Reasons are described for expecting the proposed approach to succeed and advance ADT, especially if alternative approaches have failed. The manner and extent to which the proposal will advance the Scientific and Technical Baseline are described.

The types of activities that will be performed are detailed.

Distinctive and innovative features of the approach are discussed.

Proprietary information (if available) necessary to complete the project is described, along with a plan for obtaining this information. Plans for resolving intellectual property concerns, if any are described.

5. Successful completion of the proposed project will benefit California electricity ratepayers.

Weighting Factor: 2.0 Possible Points: 20

The proposal explains how the project results will fulfill market needs. References for available market studies are provided. Needed market studies are described.

The expected outcomes—the effects of the anticipated project results on the ADT systems and stakeholder communities—are described. The specific users or market segments are targeted. Potential distributed generation application is well elucidated and quantified.

The proposal lists and describes quantitative or measurable economic impacts. Benefits such as reduced environmental emissions and costs, reduce odors, manufacturing costs, improved fuel conversion efficiency, greater reliability and durability are discussed and quantified, and related to the project objectives and goals.

The proposal lists and describes clear and significant economic objectives—desired conditions outside the project itself that will result from successful completion of the project. The potential California market size is described, as well as any significant market outside California.

Potential new environmental or safety issues associated with the expected new product are described.

The subsequent steps, the time required, and the approximate cost that must be taken to lead to a commercial product are discussed.

The market connection and timeframe for accrual of the economic benefits is discussed, along with any additional activities required realizing these benefits.

A clear quantitative distinction and apportionment is made between public and private benefits.

The proposal shows that the proposed project will develop products, increase MW capacity, develop technologies or services that address California electricity needs, and improve reliability, dispatchability, or offset peaking load demands.

If the project develops hardware, details of the extent of its expected use and the basis for that judgment are provided.

The extent to which any lawsuits or claims jeopardize completion of the grant agreement.

6. The Work Statement (Application Manual Attachment 5), Products, Due Dates and Gantt Chart (Application Manual Attachment 8) and the details of the project implementation demonstrate that there is a high probability of project success.

Weighting Factor: 2.5 Possible Points: 25

The Work Statement demonstrates a clear, appropriate and complete effort.

The Work Statement is composed of a series of interconnected, logical, and discrete tasks.

Every task contains an objective. The objectives identify expected results and accomplishments.

Every task contains a description of activities. The activities are complete and clearly described. The description is in sufficient detail to be incorporated directly into a Standard Agreement.

The products are appropriate, clearly identified, complete, and useful.

The Technology Transfer Plan is well defined and conceived and incorporates appropriate products and methods for conveying project results to stakeholders.

The Production Readiness Plan describes the factors relevant to the production of a commercially viable product.

The proposed project includes a complete Test Plan.

The proposed project addresses co-production of value-added products and market applications. Co-production of value-added products is matched to the load, and thermodynamic calculations are included.

The Work Schedule reasonably appropriates time with respect to the sequence of tasks, time allocated per task, and the use of labor, equipment and facilities.

Appropriate milestones are identified. Critical Project Reviews are incorporated in the schedule at appropriate decision points.

7. The project costs, PIER funding request, match funding, and need for PIER funding are appropriate and consistent with the expected level of public benefits.

Weighting Factor: 2.0 Possible Points: 20

The proposal demonstrates that the total project cost is appropriate, considering: 1) the significance of the barriers being addressed, 2) the project's objectives and goals, and 3) the level of effort described in the Work Statement.

The proposal demonstrates that the amount of requested PIER funding is appropriate with respect to the level of public benefits.

The proposal demonstrates that the amount of match funding is consistent with the estimated level of private benefits. The types of match funding are acceptable.

The proposal explains why the proposed project is not adequately provided by the competitive or regulated markets, and would not occur in the absence of PIER funding.

The applicant brings and will contribute extra value that was developed under prior projects.

8. The project budget information provided through Solicitation Attachment 9 is consistent with the work statement and itemize reasonable costs for personnel, subcontractors, equipment, operating expenses, etc., for each task.

Weighting Factor: 1.5 Possible Points: 15

For the tasks described in the work statement, budgets indicate the total project budget, the PIER reimbursable budget, and the matching funds budget, indicating all sources of funding.

In Application Manual Attachment 9, budgets are itemized in sufficient detail to justify the expenditures by task. The budgets include the information described in Section II, regarding personal services, subcontractors, operating expenses, and total expenditures.

The budget shows that key personnel will be committed to the project for the appropriate number of hours and functions to accomplish the activities described in the work statement.

9. The Project Director and the Project Team are well qualified to conduct the project.

Weighting Factor: 1.5 Possible Points: 15

The proposal demonstrates that the Project Director can successfully manage the project, control cost, maintain the schedule, and report results and accomplishments in an effective manner.

The proposal convincingly demonstrates, based on education, training and past experience, that the Applicant's team is capable of conducting all technical, administrative, and budgetary functions and responsibilities.

The Applicant/project team has the financial capability and skills to assure project completion.

All entities performing work on the subject technology are identified, and the nature of their efforts is described.

The resume list is complete. The resumes show that the Project Director and team members have the demonstrated capabilities and specific experience to successfully complete the project.

10. Other significant factors that increase the project's merit

Weighting Factor: 1.0 Possible Bonus Points: 10

The following are examples of other significant factors that will be considered by the proposal evaluation team:

- The proposal shows that the project approach is innovative or especially unique.
- The applicant's performance on previous Commission agreements has been superior (e.g., goals and objectives either were achieved or the applicant documented significant lessons learned, and the applicant responded to Commission direction. Deliverables/products were complete and submitted on time and within budget).

The proposed project is well-integrated with, and complementary to, other ADT RD&D efforts, such as those being funded by the US DOE, other federal government agencies, agencies from other states, the Electric Power Research Institute (EPRI), or the Gas Technology Institute (GTI), and others (please specify).

The degree to which the project contributes to a balanced PIER RD&D portfolio across technology types, levels of risk, and/or time to commercialization.

Summary of all evaluation scores

- Total possible points: 145, including bonus points
- Minimum passing score: 90.

D. Questions Related to Submission of Applications and Administrative Information

This section provides applicants with information on submitting a successful proposal, definitions of important terms, sources of information, how to submit a proposal, confidential information, grounds for rejecting a proposal, and other administrative details. Every technical proposal must establish in writing the applicant's ability to perform the tasks listed in the Work Statement.

Is There a Deadline for Submitting a Proposal to this Solicitation?

All copies of your proposal must be delivered to the Commission Grants and Loan Office during normal business hours and prior to the date and time specified in Section III.

Proposals received after the specified date and time are considered late and will not be accepted. There are no exceptions.

How Should a Proposal be Packaged and Labeled for Submittal?

Applicants must submit the required number of copies of each volume, including if necessary, the Confidential Information. The original and copies of each volume must be in a separate, sealed envelope, labeled with the following information, depending upon the contents of the envelope:

- “Volume 1 – Administrative Section”
- “Volume 2 – Technical and Cost Sections”
- “Volume 3 – Confidential Information”

All envelopes must further be labeled “PIER Targeted Biomass Solicitation for Biogas Systems or Anaerobic Digestion Technologies” and include the title of the proposal.

Is There a Preferred Method for Delivery of the Proposal?

- Applicant may deliver a proposal by:
- U. S. Mail
- Personally
- Courier service

Postmark dates of mailing, electronic mail and facsimile (FAX) transmissions are not acceptable in whole or in part under any circumstances.

What is the Address for Delivery of Proposals?

Label and deliver your proposal, in a sealed package, as follows:

Person's Name, Phone #
Applicant's Name
Street Address
City, State, Zip Code
FAX #

Biomass Target Solicitation for Biogas System or ADT

Grants and Loan Office, MS-1
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

How is Confidential Information Treated?

From the beginning of the solicitation process until the evaluation is complete and the Notice of Proposed awards is posted, the Commission is required to hold all information

received from applicants as confidential. However, proposals and all submittals will become public record after the Commission completes the evaluation and/or scoring process and the Notice of Proposed Awards is posted.

After the posting of awards,

- Confidential materials submitted by unsuccessful applicants will be destroyed and/or returned. The Commission will not retain confidential submittals from unsuccessful applicants.
- Confidential materials submitted by successful applicants will be kept confidential, pending incorporation of confidentiality determination as part of the subsequent PIER grant as appropriate.

A complete application for confidentiality pursuant to Title 20, California Code of Regulations, sections 2505(a) and 2505(c)(2)(A) may be required prior to Commission approval of the grant. These confidentiality specifications and procedures are issued in accordance with Title 20, California Code of Regulations, section 2505(c)(2)(A).

What Types of Information Are Considered Confidential?

Consistent with its confidentiality regulations, and the California Public Records Act (Government Code Section 6250 et. seq.), the Commission generally will grant confidential treatment for information that is essential to understanding the proposal, clarifies the status of technology prior to the proposed project, or will be a product.

Examples include:

- Any information that is patent pending (until a patent has been approved), including patent application numbers
- Technical trade secrets (e.g., detailed technical drawings)
- Marketing/business trade secrets (e.g., energy use data for an individual commercial or industrial facility, pending strategic partnerships with manufacturers)
- Economic/financial trade secrets (e.g., income tax records).

Conversely, the Commission generally will not allow confidential treatment for certain other types of information. Applicants are cautioned against seeking confidentiality for the following types of information:

- Project descriptions/work statements (including task descriptions, schedule of products and due dates)
- Proposed project budgets (PIER and match fund), including labor rates
- Names of employees, subcontractors and match fund participants
- Test plans and reports
- Progress reports
- Final reports.

The Commission will allow technical and business trade secrets to be reported in separate confidential addenda to test reports and final reports.

Are There Important Administrative Details I Should Know?

Applicant's Cost

The applicant is responsible for the cost of developing a proposal, and this cost cannot be charged to the State or the Commission.

Can the Commission Impose Conditions or Limits on Awards?

Yes. The Commission reserves the right to condition, modify or otherwise limit any and all PIER funding awards made pursuant to this Solicitation so as to avoid unnecessary duplication or overlap of efforts within a proposal or between proposals receiving PIER funding.

Can the Commission Cancel or Amend This Solicitation?

Yes, if it is in the State's best interest. The Commission reserves the right to do any of the following:

- Cancel this Solicitation
- Amend or revise this Solicitation as needed; or
- Reject any or all proposals received in response to this solicitation.

How will I know if the Solicitation is Revised?

If the Solicitation must be changed or revised, the Commission will prepare and mail a formal written addendum to all parties who requested a copy of the Solicitation from the Commission. In addition, the addendum will be posted on the Commission's Web Site: www.energy.ca.gov/research. The Solicitation cannot be revised after the proposal due date.

What If I Find an Error in this Solicitation Document?

If applicant discovers any ambiguity, conflict, discrepancy, omission, or other error in the solicitation, the applicant shall immediately notify the Commission of such error in writing and request modification or clarification of the document. Clarifications will be given by written notice of all parties who have obtained a solicitation, without divulging the source of the request for clarification. The Commission shall not be responsible for failure to correct errors.

Generally, What are the Grants Requirements?

Term of the Grant Agreement

The term of the grant award will be from July 2002 to March 31, 2006. Typically, the duration of a project is shorter than the term of the agreement.

PIER Grants -Terms and Conditions

Standard PIER Grants Terms and Conditions are included in this solicitation (Solicitation Attachment 4, Terms and Conditions). It is the intention of the Commission to use these Standard Terms and Conditions in all agreements awarded as a result of this solicitation. The format may change for the signed agreement but the terms will remain the same.

The content of this Solicitation and the applicant's proposal will be incorporated by reference into the final agreement.

Grant Agreement Cancellation

The Commission reserves the right to terminate any grant through this solicitation by providing a 30-day notice to the successful applicant.

No Grant Award Until Signed and Approved

The proposed grant between the Commission and the successful applicant is not in effect until the grant agreement is signed by all of the parties, which includes approval at a Commission Business Meeting, Applicant signature, and Energy Commission signature.

Grant Amendment

A grant agreement executed as a result of this solicitation can be amended by mutual consent of the Commission and the Recipient. The grant may require amendment as a result of project review, changes and additions, changes in project scope, or availability of funding.

Audit

The PIER Audit Program Bureau of State Audits, or other appropriate State agency may audit a grant awarded under this solicitation up to a period of three years after the final payment or termination of the grant.

Subcontractors

Any subcontractor the applicant chooses to use in fulfilling the requirements of this solicitation that is expected to receive more than ten percent (10%) of the value of the agreement, must also meet all administrative and technical requirements of this solicitation. The applicant must provide a summary of each subcontractor's qualifications, including experience and duties that would be performed under the Work Statement.

The Recipient is responsible for the quality of all subcontractor work, and may only replace subcontractors as specified under the Grant Terms and Conditions.

Universities

Separate terms and conditions have been negotiated with the University of California. A University of California Recipient can use these Commission-approved terms. These terms and conditions are available by contacting the Commission Grants and Loan Officer at (916) 654-5067.

Department of Energy (DOE) Laboratories

Separate terms and conditions have been negotiated with DOE Labs. DOE Labs can use these Commission-approved terms. These terms and conditions are available by contacting the Commission Grants and Loan Officer at (916) 654-5067.

What If I Decide To Modify Or Withdraw My Proposal?

Withdrawal/Modification

Applicant may, by letter to the Grants and Loan Officer, withdraw or modify a submitted proposal before the proposal deadline (due date and time) in the Schedule. Proposals cannot be changed after that date and time.

Immaterial Defect

The Commission may waive any immaterial defect or deviation contained in an applicant's proposal. The Commission's waiver shall in no way modify the proposal or excuse the successful applicant from full compliance.

How Will I Know if I Have Been Awarded A Grant?

A Notice of Proposed Awards (NOPA) will be posted for five (5) working days at the Commission's headquarters in Sacramento, and on the Commission's web site. In addition, each applicant will be mailed a copy of the NOPA.

Upon completion of the five (5) day notice period, grant documents will be prepared and sent to successful applicants for their signatures. The Commission will not consider any substantive changes to the grant "terms and conditions" contained in this solicitation. If, for any reason, a successful applicant does not sign the grant agreement documents within a reasonable time, the Commission may eliminate that project from its award list and select the next highest ranked project for funding.

After the awarded applicants have signed the grant agreement documents, the Commission will consider final approval of each grant at a publicly noticed Commission Business Meeting. The Commission at that time may approve more than one grant.

What are the Grounds for Rejection?

A proposal will be rejected if any of the following occurs:

- The proposal is not received by the time and date set for receipt of proposal listed in the Solicitation Schedule Section III.
- The entire proposal is labeled as confidential.

A proposal may be rejected if:

- The proposal does not meet eligibility and feasibility screening criteria.
- It contains false or misleading statements or references which do not support an attribute or condition contended by the competitor.

- The proposal does not comply with or contains caveats that conflict with this solicitation.
- The proposal is unsigned.
- The applicant has submitted multiple projects within a single proposal.
- The proposal is not prepared in the required format described herein.
- The proposed project is a feasibility study or a bench-scale project.

What Happens If My Proposal Is Unsuccessful?

After the NOPA is posted, each unsuccessful applicant may request a debriefing meeting with the Commission. The debriefing meeting is an opportunity for an unsuccessful applicant to learn why their particular proposal was not successful and may provide insight to improving proposal preparation for future solicitations.

What Happens To My Proposal Documents?

On the Notice of Proposed Award date, all proposals and related material submitted in response to this solicitation become the property of the State and a part of the public record, unless the applicant has submitted an application for confidentiality.

Confidential documents submitted by unsuccessful applicants will be returned to the applicant or destroyed by the Commission. Applicant identified and Commission designated confidential documents will be filed separately from the rest of the proposal and grant documents. Only authorized persons will have access to these designated confidential documents.

IV. Key Words and Their Definitions

Application: How a technology, once it is developed, is used to achieve a desired result or objective.

Applicant – offeror of proposed RD&D project

Advanced Anaerobic Digestion Technologies (ADT): Ultra-clean and super efficient anaerobic digestion prime mover systems meeting and exceeding current and any future standards for distributed generation, co-generation, and other shaft power applications in California.

Availability: A measure of time a generating unit, transmission line, or other facility is capable of providing service, whether or not it actually is in service. Typically, this measure is expressed as a percent available for the period under consideration. (Ref.: Glossary of Terms Task Force, North American Electric Reliability Council, <http://www.nerc.com/glossary/glossary-body.html>)

Baseline condition: The current, state-of-the-art technology or body of knowledge for a particular topic.

Biogas Production System: This includes digester and gas recovery but excludes energy recovery.

Commission: California Energy Commission.

COE: Cost of electricity (\$/kWh).

Grant: The agreement signed by the applicant and the Commission and approved at Commission Business Meeting.

Grant budget: The proposed Commission-reimbursable expenditures AND the Applicant's match fund expenditures for that portion of the project covered by the agreement term.

Grant term: The start and end dates stated in the agreement between the Commission and the Recipient. The project may be shorter than, coincide with, or extend beyond, the grant term. However, all Commission reimbursed and matched activities must occur during the agreement term.

Decision maker: An individual or organization that can use the results of a completed project for further RD&D, technology commercialization, or use.

Demonstration: Operation of a completed product embodying a prototype or commercial configuration of a technology for the purpose of demonstrating the attainment of project goals.
Development: Bringing into reality or activity a product embodying a commercial configuration of a technology.

Dispatchability: Generation available physically or contractually to respond to changes in system demand or to respond to transmission security constraints. (Ref.: Glossary of Terms Task Force, North American Electric Reliability Council, <http://www.nerc.com/glossary/glossary-body.html>)

Distributed Generation (DG), also referred to as Distributed Energy Resources (DER): A Commission Committee has defined DG as stationary applications of electric generating technologies that are smaller than 50 MW of net generating capacity, the Energy Commission's power plant siting jurisdiction threshold. These generating installations may be owned by electric or gas utilities; industrial, commercial, institutional or residential energy consumers; or independent energy producers. They include generating technologies such as engines, fuel cells, small and "micro" gas turbines, solar photovoltaics (PV), and wind turbines, and may be combined with electric storage technologies such as batteries and flywheels. (Ref: *Distributed Generation: CEQA Review and Permit Streamlining*, California Energy Commission Energy Facility Siting and Environmental Committee, report number P700-00-019, December 2000, page 10, available at <http://www.energy.ca.gov/distgen/documents>.) Other entities have defined DG in different ways. For example, the California Alliance for Distributed Energy Resources (CADER), Technology Characterization Committee, described DER technology characteristics as follows: "generates or stores electricity located near or at a load center, can be grid connected or isolated, has a value greater than grid power including customer value, distribution system benefits, backup or emergency power, and social or environmental value."

Economic performance objective: A degree of improvement in the capital cost, operating cost, or maintenance cost of an ADT system expressed as an improved competitive position in the market.

End user: An entity that consumes energy, including electricity or thermal energy, or that directly generates and/or markets energy systems.

Energy Recovery System: This includes gas clean up, prime mover and interconnection hardware for ADT.

Equipment: An item or group of items having a useful life of at least one year and having an acquisition unit cost of at least \$5,000. *Equipment* means any products, objects, machinery, apparatus, implements or tools purchased, used or constructed within the project, including those products, objects, machinery, apparatus, implements or tools from which over thirty percent (30%) of the equipment is composed of materials purchased for the project.

FOB: Freight on board. When referring to cost, this is the cost of the item ready for shipping from the manufacturer.

Goal: For the purposes of this solicitation, “goal” is defined as an improvement in technology or the state of knowledge that can be measured and quantified.

HHV : Higher Heating Value

Innovation: Previously unknown, unused, or not broadly adopted combination of methods, materials, processes, or conditions.

Key Personnel: Those individuals who are critical to the successful completion of the proposed project and are difficult to replace because of their experience, capabilities and knowledge.

Key Subcontractors: Those contractors, subcontractors or vendors to the Recipient who are critical to the outcome of the project. As with Key Personnel, Key Subcontractors may have expertise in the particular field, or have experience that is not available from another source and replacement may significantly affect the project. An employee of the Recipient’s subcontractor or vendor may also qualify as “key.”

LFGTE: Landfill gas to electricity.

LHV: Lower Heating Value.

Market Connection: A key objective of the PIER program is to develop energy products or services that will be applied in the real world, and will thus produce benefits for California’s electricity ratepayers. A strong connection with the market can be demonstrated by (1) identifying a specific market(s) for the products or services resulting from the RD&D efforts, (2) estimating the size of that market (and how much of that market exists in California), (3) providing an overview of the pathway(s) by which such products or services will ultimately enter the marketplace, and (4) identifying people and entities that can aid in facilitating market entry. Demonstration projects should be closely connected to the market, while fundamental research projects may have a less quantifiable market connection.

Milestone: A significant point in the performance of the project. Examples include the Critical Project Review, the completion of a task, the submittal of a product, the completed installation of a piece of hardware, and the initial operation of a new system.

Objective: For this solicitation, “objective” is defined as a desired condition outside the project itself that results from the success of the project.

Performance metric: An indicator of the performance of a product that allows the research product to be evaluated on its ability to meet the identified technical, economic and performance goals.

PON – Program Opportunity Notice

Private Benefit: For the purposes of this solicitation, private benefit is an economic return or profits that the Applicant or a member of the team acquires for its own advantage.

Products: Products are deliverables that incorporate the knowledge and understanding gained by performing the activities and that are submitted to the Commission for review, comment and approval.

Program: A collection of individual projects with the same set of overall goals and objectives, wherein each project develops a unique product or service to help achieve the overall program goals and objectives. Within a program, the individual projects are separate and their unique products or services can be developed independently (e.g., development of several different types of ADT in a coordinated effort to achieve lower costs and higher efficiencies). By simply obtaining information (as opposed to developing a product or service) does not constitute a program.

Project: An RD&D effort intended to advance a specific science and/or technology that is guided by a set of goals and objectives and that is implemented according to a valid technical approach.

Proposal: The formal written response to this Solicitation from the Applicant. If the proposal is accepted by the Commission, the proposal will be included as part of the agreement.

Public Benefit: A project produces public benefits if it achieves one or more of the following five objectives: (1) improves energy cost or value, (2) improves the environment, public health and safety, (3) improves energy reliability, quality or sufficiency, (4) strengthens the California economy, and (5) provides consumer choice. (Ref: *California Energy Commission Five-Year Investment Plan, 2002 Through 2006, for the Public Interest Energy Research (PIER) Program, Volume 1, Report to the California Legislature*, California Energy Commission, March 1, 2001. Available at <http://www.energy.ca.gov/research>.)

Recipient: Applicant, after a grant with Commission has been signed and approved.

Reliability: The degree of performance of the elements of the bulk electric system that results in electricity being delivered to customers within accepted standards and in the amount desired. Reliability may be measured by the frequency, duration, and magnitude of adverse effects on the electric supply. Electric system reliability can be addressed by considering two basic and functional aspects of the electric system Adequacy and Security. Adequacy is the ability of the electric system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system elements. (Ref.:

Glossary of Terms Task Force, North American Electric Reliability Council,
<http://www.nerc.com/glossary/glossary-body.html>)

Research: The careful, systematic, and reasonably thorough study and investigation in a particular field of knowledge, for the purpose of discovering or establishing facts or principles and developing a product or process.

Serviceable Life: Minimum hours of operation within which cost-effective maintenance can be accomplished. When unit replacement is a less expensive option, serviceable life ends.

Solicitation: The PON and Application Manual, this entire document. The competitive process of selecting project(s) to be funded under this Solicitation.

Stakeholder: An entity, such as an individual, corporation, trade organization, end user, research organization, university, regulatory body, government agency, financial organization, sponsor, or marketer that has a title, financial share, special skill or resource, mandated responsibility, or other direct interest in the undertaking to develop, enable, negotiate, deploy, or commercialize a technology.

State: State of California.

Subject technology: The body of knowledge, system component, device, generating system, manufacturing technique, material, etc. that will be improved as a result of the project proposed by the applicant. For example, development of anaerobic digestion system for microturbine application.

Task: A distinct research effort that includes an objective, a description of related activities, and a list of products. Within this Solicitation, the task is the lowest level of a research effort. Multiple tasks support a project.

Team Member: A stakeholder with contractual responsibilities to the Commission (i.e., the applicant), or to the applicant (e.g., subcontractors, consultants, etc.), associated with a project. Such team members may include, but are not limited to, ADT system manufacturers, suppliers, vendors, universities, research organizations, a National Laboratory, technology owners, industry trade organizations, and end users.

Technical Performance Objective: A qualitative degree of improvement in the performance of an ADT system, component, or subsystem.

Technological baseline: The current state of-the-art or the developmental status of the subject technology to be developed, or the body of knowledge to be advanced.

Technology: The general subject area where the product or innovation would be used.

Usability: An index indicating the ease of operation from the end-user perspective.

V. Application Manual Attachments and Forms

Volume 1 Forms

- 1 Application and Project Information Form
- 2 Project Team List, Key Personnel, Key Subcontractors
 - Narrative Description of Skill and Experience
 - Resumes

Volume 2 Forms

- 3 Executive Summary Form
- 4 PIER Grants - Terms and Conditions
- 5 Exhibit A - Work Statement
- 6 Exhibit A1 - Progress Report Format
- 7 Exhibit A2 – Final Report Instruction
- 8 Exhibit B - Products, Due Dates, and Gantt Chart
- 9 Exhibit C – Budgets
Instruction for Providing Information
- 9 Exhibit C1- Personal Hourly Rates and Benefits
- 9 Exhibit C2- Calculation of rates
- 9 Exhibit C3- Detailed Task Budgets
- 9 Exhibit C4- Summary of Allowable Travel and Per Diem Expenses

Volume 3 Confidential Information

- 10 Exhibit E – Confidential and Pre-Existing Intellectual Property List

APPLICATION AND PROJECT INFORMATION FORM

Biomass/PIER Renewables Energy Program Area
Targeted Biomass Solicitation for Biogas Systems or Anaerobic Digestion Technologies
(ADT)

This document provides the Commission with some basic information about your business and project to help us process your proposal. This attachment must be submitted and signed with each proposal.

1. Applicant Information

Full Legal Name of Applicant _____

Business Address _____
(Street number and name) (Mail stop/suite number)_____
(City) (County) (State) (Zip code)

Nature of Business _____

Contact Person _____ Telephone _____

Title _____ FAX _____

Tax Payer ID Number _____ E-mail _____

2. Project Information

Brief Project Title _____

Project Work Site Location _____

3. Project Focus (Please select and check the most appropriate Project Focus)☐ ADT using Livestock Manure (identify type) _____☐ ADT using Landfill Waste _____☐ ADT using Wastewater _____☐ ADT using Food Processing Wastes _____☐ Others: Please Specify: _____

4. Project Costs and Requested Funding

Amount of PIER Funding Requested: \$_____

Amount of Match Funding being supplied: \$_____

Total Project Costs: \$_____

5. Expected Duration of Project

Length of proposed project (months):

Estimated project end date (month/year):

6. Business Type

Number of Employees _____ Year Established _____

How Long Under Current Ownership _____ Legal Form of Business: (check one)

☐ Sole Proprietorship

☐ Limited Partnership

☐ General Partnership

☐ Corporation

☐ Sub-Chapter S Corporation

☐ Other (identify)

If Corporation, attach Articles of Incorporation. If Partnership, attach Partnership Agreement. If Sole Proprietorship, attach Fictitious Name Filing immediately following this Attachment.

7. Management and Ownership Information Applicants must provide the following management and ownership information:

Management

Name Title Years w/Company

Ownership (list all corporate and partnership Applicants)

Shareholder/Partner % Ownership SS#

General or Limited

8. **Corporate Status.** Please answer the following questions. If you answer yes to any of the questions please provide a detailed explanation.

YES NO

- ☐ ☐ Has your business or you as a sole proprietor, ever filed bankruptcy or defaulted on any debts?
- ☐ ☐ Is your business or you as a sole proprietor, a party to any claim or lawsuit?

10. **Confidentiality Requests:** Are you submitting any confidential material under a separate cover?

Yes ☐ (*see* attachment 10 of the Application Manual)

No ☐

11. **Project Abstract** (No More Than 250 words):

12. Authorization and Certification

I hereby authorize the California Energy Commission to make any inquiries and obtain any financial information necessary to evaluate my organization's capability to supply the necessary financial support to the proposed project. In addition, I authorize the California Energy Commission to make any necessary inquiries to verify the information I have presented.

I hereby certify to the best of my knowledge and belief that I have read and understand the terms and conditions contained in this Application package and that the information contained in this proposal is correct and complete.

Signature of Authorized Representative

Date

Typed Name

Title

PROJECT TEAM LIST, KEY PERSONNEL, KEY SUBCONTRACTORS

The Final Proposal must contain this Attachment 2. Attachment 2 provides a brief description of your project team's qualifications. In a brief narrative of 350 words or less please provide a cursory overview of your project team including key personnel and participants.

- For each project participant please provide a brief narrative of their qualifications, including but not limited to education and work experience.
- Describe how your project team will be managed to ensure that the project will be completed on schedule and within budget.
- Provide an organization chart of the project team including reporting lines.
- In a resume format provide a brief description of qualifications and experience of key project participants, including applicant staff and subcontractors when necessary.
- Describe the rights and obligations of other sponsors and describe the qualifications of the applicant and subcontractors.
- Please list and briefly describe projects that your project team has worked on in the past five years that illustrate your team's technical skills in developing small-distributed biomass generation technologies.

EXECUTIVE SUMMARY FORM

**Biomass/PIER Renewables Energy Program Area
Targeted Biomass Solicitation for Biogas Systems or Anaerobic Digestion Technologies
(ADT)**

Prepare an Executive Summary of the project (no longer than two [2] pages), which describes:

1. The problem, barrier, or deficiency, amenable to a RD&D solution, that the proposed ADT project will address in relationship to other current work in the field.
2. The ADT technology or science being developed and advanced.
3. Type of biomass resources and explanation of its sustainability for the proposed ADT
4. Technical and economic feasibility studies
5. Market needs and assessment
6. The unique products, services or levels of understanding that are expected to result from the project.
7. The technical approaches and projects steps that explain what will be done and how it will be done.
8. The quantitative goals and objectives of the project.
9. The overall project cost.
10. The amount of PIER funding being requested.
11. The amount, sources and nature of match funding.
12. The types estimated amounts and timing of public benefits to be provided in California if the project is successful and if the results are incorporated into commercial products. California public benefits include, but are not limited to, energy benefits such as the annual amount of electrical energy to be saved, economic benefits, the amount of electrical power price reduction expected, environmental benefits such as the tons per year of pollutants reduced, the installed capacity of ADT systems in a specified future year, and/or the degree to which system reliability or power quality is enhanced.

APPLICATION MANUAL ATTACHMENT 3

13. Estimated amounts of additional time and spending, if any, required to realize the public benefits that are being claimed for this project. Identify the types of entities that would be involved in these additional efforts.

PLEASE NOTE:

Attachment 4 - Terms and Conditions

will be posted on our website on

April 8,2002.

**WORK STATEMENT
(GRANT EXHIBIT A)**

GLOSSARY

Specific terms and acronyms used throughout this work statement are defined as follows:

<i>Acronym</i>	<i>Definition</i>
	(Insert additional rows as needed.)

TASK 1: PROJECT START-UP**Subtask 1.1 Attend Kick off Meeting**

The goal of this task is to identify procedures for communication and reporting project status during the contract.

The Recipient shall:

- Attend a “kick off” meeting with the Commission Project Manager and the Grants Officer to review: 1) the Commission’s expectations for accomplishing tasks described in the Work Statement; 2) the administrative requirements in the terms and conditions of the agreement (e.g., invoicing, prior approvals, data disclosure limitations, progress reporting format and content, etc.); and 3) the Commission's role and responsibilities. The Commission Project Manager shall designate the location of this meeting.

Product:

- Attend kick-off meeting

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.
Example: John Doe)

Key Subcontractors:

*(Name of key company or name of key person at key company for this task. If none, state none.
Example: Davis Construction or Susie Smith, Perfect Turbines)*

Subtask 1.2 Document Matching Funds

The goal of this task is to document the match funds for this agreement. The Recipient need not resubmit match fund documentation if it was provided in the Recipient's proposal and the information submitted is still valid. The Recipient, however, shall assist the Commission Project Manager to locate this proposal information, upon request. In the event match fund sources change during the agreement term, the Recipient shall immediately notify the Commission Project Manager for approval.

Documentation of match fund commitments shall be received, reviewed and approved in writing by the Commission Project Manager before any PIER funds under this agreement are disbursed and PIER-funded work on technical tasks may begin.

The Recipient shall:

- Provide the following information about the match funding to be used to conduct this project:
 1. Amount and source of each cash match funding, including a contact name, address and telephone number.
 2. Description, documented market or book value, and source of each in-kind contribution, including a contact name, address and telephone number.

If the in-kind contribution is equipment or other tangible or real property, the Recipient shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
 3. Written commitment from each source of cash match funding or in-kind contributions that these funds or contributions have been secured or will be secured prior to the date(s) when the funds or in-kind contributions are required for project expenditures.
 4. If there are no match funds at the start of the agreement, then state such in the letter.

In the event the Recipient has not provided the written match fund commitments for this project by three months after the agreement execution date, the Commission may, at its option and in its unfettered discretion, terminate this agreement by advising Recipient in writing that the agreement will be terminated in thirty (30) calendar days.

Products:

- Letter and documentation confirming matching fund sources.
- Documentation of changes as they occur during the agreement term.

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.

Example: John Doe)

Key Subcontractors:

(Name of key company or name of key person at key company for this task. If none, state none.

Example: Davis Construction or Susie Smith, Perfect Turbines)

Task 1.3 Identify and Obtain Required Permits

The goal of this task is to obtain all permits required for work completed under this agreement in advance of the date they are needed to keep the project schedule on track.

The Recipient shall:

- If no permits are required to conduct this project, the Recipient shall state this finding in writing to the Commission Project Manager.
- Provide the following information about permits required for this project:
 - Type of permit
 - Name, address and telephone number of the permitting jurisdictions or lead agencies
 - Schedule the Recipient will follow in applying for and obtaining these permits
 - A copy of each approved permit
- Submit this information to the Commission Project Manager at the kick-off meeting. The schedule for obtaining permit(s) will be discussed at the kick-off meeting, and a timetable for submitting the updated lists and the copies of the permit(s) will be developed.
- In all cases, permits must be identified in writing and obtained before any costs related to the use of the permit(s) are incurred for which PIER reimbursement will be requested under this agreement.
- Permit expenses are not reimbursable through the agreement; therefore, the PIER budget for this task will be zero dollars.

Products:

- A statement that no permits are required
or
- A list of all permits required for this project
- Updated list of permits as they change during the agreement term.
- A copy of each approved permit.

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.

Example: John Doe)

Key Subcontractor:

*(Name of key company or name of key person at key company for this task. If none, state none.
Example: Davis Construction or Susie Smith, Perfect Turbines)*

TASK 2.0 TECHNICAL TASKS

The project's work scope involves the following technical tasks:

Examples only: **TASK 2.1:** (Title)
 TASK 2.2: (Title)
 TASK 2.3: (Title)
 TASK 2.4: (Title)
 TASK 2.5: (Title)
 TASK 2.n-1: Technology Transfer Activities
 TASK 2.n: Production Readiness Plan

Critical Project Reviews

Critical Project Reviews shall take place at key points in a given project. These generally occur at predetermined points to see if the overall project goal is being achieved. The Commission will conduct Critical Project Reviews during or at the conclusion of the following tasks:

(Insert the task numbers and titles here)

Critical Project Reviews are meetings between the Recipient, the Commission Project Manager and other individuals selected by the Commission Project Manager to provide objective, technical support to the Commission. Meeting participants may include PIER Program Team Lead, Grants and Loans Officer, Commission Technical Staff and Management. The purpose of these meetings is to discuss with the Recipient the status of the project and its progress toward achieving its goals and objectives. These meetings may take place either at the Energy Commission offices in Sacramento, or at another reasonable location determined by the Commission Project Manager and the Recipient.

Before each Critical Project Review meeting, the Recipient shall provide the relevant task product(s) to the Commission Project Manager and any other designated reviewers sufficiently in advance to permit review of the product(s) before the review meeting. If not already defined in the Work Statement, the Commission Project Manager shall specify the contents of the product(s).

At the Critical Project Review meeting, the Recipient shall present the required technical information and participate in a discussion about the project with the Commission Project Manager and other meeting attendees, if any.

Following the Critical Project Review meeting, the Commission Project Manager will determine whether the Recipient is complying satisfactorily with the Work Statement and whether the project is demonstrating sufficient progress toward achieving its goals and objectives to warrant continued PIER financial support for the project.

As an outcome of each Critical Project Review, the Commission Project Manager will provide a written response within 10 working days to the Recipient indicating his or her conclusions about the project to date. The written response may include a requirement for the Recipient to revise one or more products that were included in the Critical Project Review. After each review, the Commission Project Manager may reassess and reallocate the tasks, schedule, products and budget for the remainder of the work including not proceeding with one or more tasks.

If the Commission Project Manager concludes that satisfactory progress is not being made, this conclusion will be referred to the Commission's Research, Development and Demonstration Policy Committee for its concurrence.

Technical Task Descriptions

Task 2.1 Insert Task Name

The goal of this task is to . . . (Complete the sentence)

Successful completion of this task will be measured by . . . (Complete the sentence)

This goal helps to achieve the project objectives by. . . (Complete the sentence)

The Recipient shall:

- Active verb . . . (Complete the sentence)
- Active verb . . . (Complete the sentence)

Products:

- 1st Product
- 2nd Product

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.

Example: John Doe)

Key Subcontractors:

(Name of key company or name of key person at key company for this task. If none, state none.

Example: Davis Construction or Susie Smith, Perfect Turbines)

Task 2.2 – 2.n-2

(Repeat the process as shown above)

Task 2.n-1 Technology Transfer Activities

The goal of this task is to develop a plan to make the knowledge gained, experimental results and lessons learned available to decision-makers in industry and government.

The Recipient shall:

- Prepare a Technology Transfer Plan. The plan shall explain how the knowledge gained in this project will be made available to the public. The level of detail expected is least for research-related projects and highest for demonstration projects. Key elements from this report shall be included in the Final Report for this project.
- Submit the draft Technology Transfer Plan to the Commission Project Manager for review and comment. Once agreement on the draft plan has been reached, the final plan shall be submitted to the Commission Project Manager for written approval, which shall be provided within 5 working days of receipt.
- Conduct technology transfer activities in accordance with the Technology Transfer Plan. These activities shall be reported in the Monthly Progress Reports.

Products:

- Draft Technology Transfer Plan
- Final Technology Transfer Plan

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.

Example: John Doe)

Key Subcontractors:

(Name of key company or name of key person at key company for this task. If none, state none.

Example: Davis Construction or Susie Smith, Perfect Turbines)

Task 2.n Production Readiness Plan (*Insert this task if required.*)

The goal of the plan is to determine the steps that will lead to the mass manufacturing of the technologies developed in this project.

The Recipient shall:

- Prepare a Production Readiness Plan. The degree of detail in the Production Readiness Plan discussion should be proportional to the complexity of producing the proposed product and its state of development. The plan shall include as appropriate but not be limited to:
 - Identification of critical production processes, equipment, facilities, personnel resources, and support systems that will be needed to produce a commercially viable product;
 - Internal manufacturing facilities, as well as supplier technologies, capacity constraints imposed by the design under consideration, identification of design critical elements and

APPLICATION MANUAL ATTACHMENT 5

the use of hazardous or non-recyclable materials. The product manufacturing effort may include “proof of production processes”;

- A projected “should cost” for the product when in production;
 - The expected investment threshold to launch the commercial product;
 - An implementation plan to ramp up to full production.
-
- Submit the draft Production Readiness Plan to the Commission Project Manager for review and comment. Once agreement on the draft plan has been reached the final plan shall be submitted to the Commission Project Manager for written approval, which shall be provided within 5 working days of receipt.

Products:

- Draft Production Readiness Plan
- Final Production Readiness Plan

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.

Example: John Doe)

Key Subcontractors:

(Name of key company or name of key person at key company for this task. If none, state none.

Example: Davis Construction or Susie Smith, Perfect Turbines)

TASK 3.0 REPORTING TASKS

TASK 3.0 Reporting Tasks

3.1 Monthly Progress Reports

The objective of this task is to periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this program.

The Recipient shall prepare a written Monthly Progress Report to the Commission Project Manager by the 30th of each month, starting after contract execution and shall continue each following month until the Final Report has been accepted by the Commission Project Manager. The Commission Project Manager shall provide the format and content requirements for these reports. Attachment 6 provides the format and content requirements for these reports.

Products:

- Monthly progress reports

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.

Example: John Doe)

Key Subcontractors:

(Name of key company or name of key person at key company for this task. If none, state none.

Example: Davis Construction or Susie Smith, Perfect Turbines)

3.2 Final Report

The Final Report shall be a public document. If the Recipient has obtained confidential status from the Commission and will be preparing a confidential version of the Final Report as well, the Recipient shall perform the following tasks for both the public and confidential versions of the Final report. Attachment 7 provides the format and content requirements.

Subtask 3.2.1 Final Report Outline

The Recipient shall:

- Prepare an outline of the Final Report describing the original purpose, approach and results of the project. The Commission Project Manager shall provide the suggested format for this outline.

APPLICATION MANUAL ATTACHMENT 5

- Submit the final report outline to the Commission Project Manager for review and approval. Once agreement on the outline has been reached, it shall be submitted to the Commission Project Manager within 5 working days. The Commission Project Manager shall provide written approval within 5 working days of receipt.

Products:

- Final Report Outline

Subtask 3.2.2 Draft Final Report

The Recipient shall:

- Prepare the Draft Final Report for the project. The format of the report shall follow the approved outline.
- Submit the draft final report to the Commission Project Manager for review and comment. The Commission Project Manager will provide written comments within 20 working days of receipt. The Recipient shall revise the draft final report incorporating the Commission Project Manager's corrections and required changes. Once agreement on the draft final report has been reached, the Commission Project Manager shall provide written approval within 5 working days.

Products:

- Draft Final Report

Subtask 3.2.3 Final Report

The Recipient shall:

Submit the final report within 10 working days of receipt of the approval letter. The Recipient shall submit two unbound copies and one electronic copy of the Final Report to the Commission Project Manager.

Products:

- Final Report

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.

Example: John Doe)

Key Subcontractors:

(Name of key company or name of key person at key company for this task. If none, state none.

Example: Davis Construction or Susie Smith, Perfect Turbines)

Task 3.3 Final Meeting

A final meeting for project closeout will be attended by, at a minimum, the Recipient and the Commission Project Manager. The technical and administrative aspects of agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Project Manager.

The technical portion of the meeting shall present findings, conclusions, and recommended next steps (if any) for the project. The Commission Project Manager will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the Commission Project Manager and the Grants Officer about the following agreement closeout items:

- Commission's request for specific "generated" data (not already provided in agreement products)
- "Surviving" agreement provisions
- Final invoicing and release of retention

Products:

- Meeting participation
- Written documentation of meeting agreements and all pertinent information.

Key Personnel:

(Name of key person for this task that works for the Recipient. If none, state none.

Example: John Doe)

Key Subcontractors:

(Name of key company or name of key person at key company for this task. If none, state none.

Example: Davis Construction or Susie Smith, Perfect Turbines)

**CONTENT AND FORMAT OF PROGRESS REPORTS
(GRANT ATTACHMENT 1)**

**PROGRESS REPORT for
Project Title, Grant Number
Month, Year**

Recipient Project Manager:
Commission Project Manager:

What we planned to accomplish this period

[This is taken directly from the section on “What we expect to accomplish during the next period” from the last progress report]

What we actually accomplished this period

[Concise description of major activities and accomplishments.]

How we are doing compared to our plan

[Explain the differences, if any, between the planned and the actual accomplishments. Describe what needs to be done, if anything, to get back on track.]

Significant problems or changes

[Describe any significant technical or fiscal problems. Request approval for significant changes in work scope, revised milestone due dates, changes in key personnel assigned to the project, or reallocation of budget cost categories. If none, include the following statement: “Progress and expenditures will result in project being completed on time and within budget.”]

What we expect to accomplish during the next period

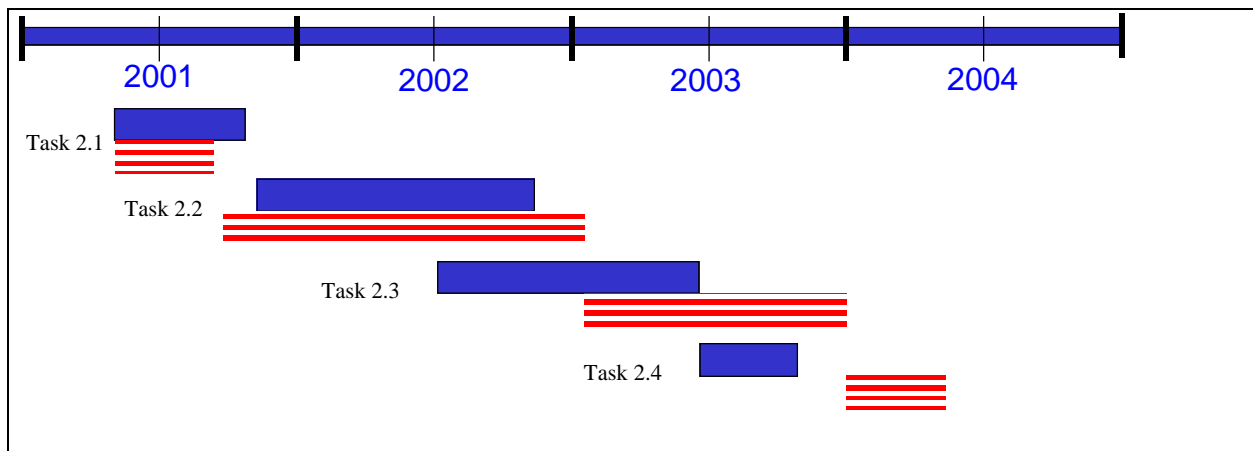
[Concise description of major activities and accomplishments expected. This will be transferred to the next progress report]]

Status of Milestones and Products:

[This should be the complete list as contained in the revised scope of work and Exhibit B. Highlight differences between actual and planned.]

APPLICATION MANUAL ATTACHMENT 6

Description	Start Date		Due Date		Status (%)
	Planned	Actual	Planned	Actual	
Identify top 3 assessment candidates	4/15/12	4/15/12	5/1/12	5/1/12	Ontime 100%
Develop test plan	4/20/12	4/10/12	7/7/12	6/10/12	Ahead 100%
Analyze experimental data	5/1/12	6/1/12	1/1/13	2/1/13	Delayed 25%



Overall schedule for the _____ project.

[Planned is solid blue, actual is red striped. This work flow diagram needs to correlate with the schedule in Exhibit B. This example has been prepared as a Word Picture, but a comparable Excel diagram or Gantt chart is fine.]

Overview of Fiscal Status: (See invoices for detail.)

[It is useful to track the rate of expenditure of project funds. The most useful way to do this is to compare the actual expenditure rate with the planned expenditure rate. You get the planned rate at the beginning of the project, so it becomes a baseline. If you change course at a critical project review, you should show the original and the modified baseline, and then track against the new one.]

Photographs:

[Include photographs where appropriate to document progress.]

Notes:

The tracking for tasks and money is generally done at the major task level, but this depends on the project and fiscal controls.

APPLICATION MANUAL ATTACHMENT 6

Notice that there is no technical detail in these reports. This should come in specific deliverables so that critical project management information doesn't get lost. If the Recipient is reporting monthly, but submitting invoices quarterly, then use the three monthly reports as an equivalent quarterly report. Don't make them write another report just to get paid.

The progress report on each project should be 1-2 pages long (plus photographs) and take about 1 hour to prepare for each reporting period.

Final Report Instructions

(Grant Attachment 2)

Final Report Contents

PIER Reports contain the following sections:

- Cover Page and Title Page
- Legal Notice
- Acknowledgement Page
- Table of Contents
- Preface
- Executive Summary
- Abstract
- Introduction
- Project Approach
- Project Outcomes
- Conclusions and Recommendations
- Endnotes
- References
- Glossary
- Appendices
- Attachments

Please contact Susan Patterson (916) 654-4992, spatters@energy.state.ca.us before starting your final report. She will explain the process and go over any questions you have. It is best if both the Recipient and the Commission Project Manager participate in this discussion.

Please use the MS Office Suite for your final reports. The version currently in use at the Commission is “97” operating on Windows 98. Please contact us if significant portions of the report will be in other programs.

Cover Page and Title Page

Please create one page with the following information. It will be used to create the cover and title pages.

- Title of the Report
- Name of primary author(s) or principal investigator
- Author’s company, organization or affiliation
- Location of author’s company, organization or affiliation (City, State)
- Name of Energy Commission Project Manager

- PIER Program Area
- PIER Program Area Lead
- Grant Award Number
- Amount of Grant
- Publication Number (Ask Susan Patterson, (916) 654-4992 for this number.)
- Publication Date (Month and Year. Verify with Susan Patterson.)

Legal Notice

Use the following notice:

Legal Notice

This report was prepared as a result of work sponsored by the California Energy Commission (Commission, Energy Commission). It does not necessarily represent the views of the Commission, its employees, or the State of California. The Commission, the State of California, its employees, contractors, and subcontractors make no warranty, express or implied, and assume no legal liability for the information in this report; nor does any party represent that the use of this information will not infringe upon privately owned rights. This report has not been approved or disapproved by the Commission nor has the Commission passed upon the accuracy or adequacy of this information in this report.

NOTE: The abbreviation "CEC" is not allowed in final reports. Chose either Commission or Energy Commission throughout the report. Be consistent with one of the choices, and use it throughout the report.

Acknowledgement Page

This is the place for the author or principal investigator to acknowledge or express appreciation to those who participated in the project. This may be a paragraph, or a list of names, and if appropriate their affiliations.

Table of Contents

Sections to be included in the Table of Contents are as follows:

Preface

Executive Summary

Abstract

1. Introduction
 - Background and Overview (Why this project was necessary)
 - Project Objectives (What you planned to accomplish)
 - Report Organization
2. Project Approach (What you did to accomplish your objectives)
3. Project Outcomes (What happened?)
4. Conclusions and Recommendations
 - Conclusions (What you learned from what happened)
 - Commercialization Potential
 - Recommendations (What you think should occur next)
 - Benefits to California

Endnotes

References

Glossary

List of Figures

List of Tables

Appendices

Attachments

Preface

Fill in the grant project name, grant award number, report title, organization, research area, and numbers in the second to the last paragraph. Use the following Preface:

Preface

The Public Interest Energy Research (PIER) Program supports public interest energy research and development that will help improve the quality of life in California by bringing environmentally safe, affordable, and reliable energy services and products to the marketplace.

The PIER Program, managed by the California Energy Commission (Commission), annually awards up to \$62 million to conduct the most promising public interest energy research by partnering with Research, Development, and Demonstration (RD&D) organizations, including individuals, businesses, utilities, and public or private research institutions.

PIER funding efforts are focused on the following six RD&D program areas:

- Buildings End-Use Energy Efficiency
- Industrial/Agricultural/Water End-Use Energy Efficiency
- Renewable Energy
- Environmentally-Preferred Advanced Generation
- Energy-Related Environmental Research
- Strategic Energy Research.

What follows is the final report for the [Grant Project Name], [Grant Number], conducted by the [Company/Organization/Affiliation]. The report is entitled [Report Title]. This project contributes to the [PIER Program Area] program.

For more information on the PIER Program, please visit the Commission's Web site at: <http://www.energy.ca.gov/research/index.html> or contact the Commission's Publications Unit at 916-654-5200.

Executive Summary

A final report in miniature, containing all key information. Summarizes the introduction, purpose, project objectives, project outcomes, conclusions, recommendations and benefits to California. It is intended to be short, bullet formatting is suggested. Assume a non-technical, management-level readership. You may want to write this as if you will hand it out at a trade show. Emphasize the benefits of the project and include who should care and why. Put on the hat of an inquisitive, reasonably well-educated lay reader who may be interested in purchasing or implementing the subject technology. Pretend that they just paid for this research project and they want to understand how and why you spent their money.

If your project has more than one project, repeat this organization for each project area. The Executive Summary needs to summarize the report, not present new information found nowhere else in the document. Go the Commission web site for further examples.

Abstract

This section should be the technical counterpart to the executive summary. Less marketing and sales oriented than the Executive Summary. This should be similar to what you would find in a technical trade periodical. Limited to 250 words, essentially a very brief, Executive Summary. The Abstract covers the purpose, objectives, outcomes and conclusions. Contains 5-10 keywords for computer searches. Geared toward a more technical audience.

Introduction

- Background and Overview (Why this project was necessary) - Provide relevant background, identify this project's subject area and the goals of this research. Use Stages and Gates terminology, where appropriate, to identify what stage the project has reached in its path to market. Refer to the contract for this information.
- Project Objectives (What you planned to accomplish) - Present the technical and economic objectives for your project. The objectives need to contain the way(s) to measure or know the success of having reached the objective. Use Stages and Gates terminology where appropriate. These should be taken from the contract and should reflect any changes made during critical project reviews or at other times during the course of the project. (Describe why these changes were made in the Project Approach section.)

Each objective shall be separately identified, a useful form is:

Project objectives were to:

- Verify (an action verb followed by relevant text)....
 - Determine....
 - Measure...
 - Develop....
- Report Organization – Provides a roadmap to the rest of the report. If there are separate final reports for a multitasked project, set the context in Background section and refer the reader to their location here.

Project Approach

This section discusses the tasks you undertook and your approach to the research (What you did to accomplish your objectives). Discuss the testing procedures you undertook and the system modifications and improvements you made.

Project Outcomes

This is where you present your results (What happened). Organize this section so that results are presented in the same order as the objectives. A short version of each Outcome should be stated in bullet form. Supporting paragraphs that describe each Outcome should follow each bullet.

There can be more Outcomes than there were Objectives. For example, there may be more than one Outcome per Objective. It is also possible to have an unanticipated Outcome during your research. However, you cannot have stranded objectives; all Objectives, whether met or not, must be discussed in this section. If this section is particularly long, then it is useful to create a summary at the end of this section where all of the bullets are drawn together as a summary.

Conclusions and Recommendations

- **Conclusions** (What you learned from what happened) - Organize the Conclusions in the same order as Objectives and Outcomes. You may have Conclusions that are broader than individual Objectives and Outcomes. Please present these after you present the individual Conclusions. Conclusions must be drawn from evidence presented in the report.
- **Commercialization Potential** - This is where you should directly address stages and gates. Explain where your project is in stages and gates. If your project had a task to prepare a Production Readiness Plan or a similar effort related to assessing where the research is in relationship to being used in its relevant markets (i.e. Stages and Gates), this is the place to discuss that task.
- **Recommendations** (What you think should occur next) - Recommendations should derive from the Conclusions presented. Recommendations specific to individual Objectives, Outcomes and Conclusions should be presented in the original order. General Recommendations should follow. Use Stages and Gates terminology where appropriate. What is the next stage for this project?
- **Benefits to California** - This section discussed two issues: (1) what benefits has California already received from this contract, if applicable, and (2) if this project is successful and the results widely used, how will California benefit. These benefits need to be related to the problems this research was intended to address. Refer to the Introduction section of the report.

Endnotes

Endnotes are preferred to footnotes.

Glossary

If there are more than 10 acronyms then a glossary with definitions for each acronym should be provided at the end of the report.

References

This is where you list all documents referred to in the body of the report. List references in standard bibliographic format. Be sure to check that shorthand references contained in the body of the report are accurate. Any documents referred to in the Appendices should be listed in the reference section in the appropriate Appendix.

Appendices

Designated by Roman numerals.

Attachments

If absolutely required, designated by Roman numerals.

Here is some additional guidance on how to ensure that the reports are technically accurate and internally consistent:

1. Put on the hat of an inquisitive, reasonably well-educated lay reader. Pretend that they just paid for this research project and they want to understand how and why you spent their money.
2. Apply the test of completeness. Are all the pieces there? Are all the references clear and do those in the text match those in the reference section? Are the relationships between the partners and the players clearly explained?
3. Apply the test of logic. Does the document flow and make sense? Is the need for the research clearly described? Is the technical approach clearly described? Do the conclusions make sense? Are they drawn from the analysis? Do the numbers check? Is it clear how the numbers were derived?
4. If the project didn't do everything it intended to do, explain.
5. The final report must primarily address the project work statement. Doing this will help manage the scope and the effort required for this report. A) Some research projects are Stage X (e.g. one stage of stages and gates) of a longer-term program and all work done during the time the Commission was involved was funded by all of the partners. B) In other cases, the work being done in this Stage of the program had more tasks than the Commission participated in, although some of the results of this work may have impacted, or been impacted by the other tasks. The Commission funded portion of the research project (or program) needs to be clearly differentiated from the overall program of which this portion of the research is a part. Comments about the program should not be intermingled with those about the project.

6. The objectives of the research project need to be clearly stated. The objectives of the Commission funded research project need to be clearly differentiated from the objectives of the overall program of which the research is a part. The objectives of the program should not be intermingled with the objectives of the project. If some objectives of the program will be performed elsewhere, or at another time, this needs to be explained. The report should then stay focused on the objectives of this project.
7. There needs to be a clear relationship between the objectives and the outcomes. The outcomes of the Commission funded research project need to be clearly differentiated from the outcomes of the overall program of which the research is a part. The outcomes of the program should not be intermingled with the outcomes of the project.
8. The methods used to conduct the research need to be explained.
9. Data that is presented in the report needs to be analyzed. If you present a picture, graph or table, be sure that you discuss it in the text, not just refer to it.
10. Each conclusion needs to be substantiated by the analysis contained in the report.
11. Figures and Tables must clearly relate to, and be consistent with the text, and vice versa. (If the text says the generator had a capacity of 30 kW, the table shouldn't say it was 31.2 kW.)
12. Use consistent references to report performance specifications and results. For example, if a piece of equipment is to be referred to by its nominal nameplate rating then use that reference consistently throughout the report. If however the desired number was the measured performance of the device, (almost always different from nameplate) then consistently use that measured number. Do not mix the two in the narrative.
13. The text needs to clearly refer to the attached appendices. It should also explain how the data in the appendices matters to the text. If it doesn't really matter, it probably should be dropped. (You may still need it because it is a deliverable according to the contract, so check this carefully.) References to multi-page appendices need to be specific to the page or section of the appendix, not just a general reference to Appendix X.

Final Report Instructions

(Grant Attachment 2)

Final Report Contents

PIER Reports contain the following sections:

- Cover Page and Title Page
- Legal Notice
- Acknowledgement Page
- Table of Contents
- Preface
- Executive Summary
- Abstract
- Introduction
- Project Approach
- Project Outcomes
- Conclusions and Recommendations
- Endnotes
- References
- Glossary
- Appendices
- Attachments

Please contact Susan Patterson (916) 654-4992, spatters@energy.state.ca.us before starting your final report. She will explain the process and go over any questions you have. It is best if both the Recipient and the Commission Project Manager participate in this discussion.

Please use the MS Office Suite for your final reports. The version currently in use at the Commission is “97” operating on Windows 98. Please contact us if significant portions of the report will be in other programs.

Cover Page and Title Page

Please create one page with the following information. It will be used to create the cover and title pages.

- Title of the Report
- Name of primary author(s) or principal investigator
- Author’s company, organization or affiliation
- Location of author’s company, organization or affiliation (City, State)
- Name of Energy Commission Project Manager

- PIER Program Area
- PIER Program Area Lead
- Grant Award Number
- Amount of Grant
- Publication Number (Ask Susan Patterson, (916) 654-4992 for this number.)
- Publication Date (Month and Year. Verify with Susan Patterson.)

Legal Notice

Use the following notice:

Legal Notice

This report was prepared as a result of work sponsored by the California Energy Commission (Commission, Energy Commission). It does not necessarily represent the views of the Commission, its employees, or the State of California. The Commission, the State of California, its employees, contractors, and subcontractors make no warranty, express or implied, and assume no legal liability for the information in this report; nor does any party represent that the use of this information will not infringe upon privately owned rights. This report has not been approved or disapproved by the Commission nor has the Commission passed upon the accuracy or adequacy of this information in this report.

NOTE: The abbreviation "CEC" is not allowed in final reports. Chose either Commission or Energy Commission throughout the report. Be consistent with one of the choices, and use it throughout the report.

Acknowledgement Page

This is the place for the author or principal investigator to acknowledge or express appreciation to those who participated in the project. This may be a paragraph, or a list of names, and if appropriate their affiliations.

Table of Contents

Sections to be included in the Table of Contents are as follows:

Preface

Executive Summary

Abstract

1. Introduction
 - Background and Overview (Why this project was necessary)
 - Project Objectives (What you planned to accomplish)
 - Report Organization
2. Project Approach (What you did to accomplish your objectives)
3. Project Outcomes (What happened?)
4. Conclusions and Recommendations
 - Conclusions (What you learned from what happened)
 - Commercialization Potential
 - Recommendations (What you think should occur next)
 - Benefits to California

Endnotes

References

Glossary

List of Figures

List of Tables

Appendices

Attachments

Preface

Fill in the grant project name, grant award number, report title, organization, research area, and numbers in the second to the last paragraph. Use the following Preface:

Preface

The Public Interest Energy Research (PIER) Program supports public interest energy research and development that will help improve the quality of life in California by bringing environmentally safe, affordable, and reliable energy services and products to the marketplace.

The PIER Program, managed by the California Energy Commission (Commission), annually awards up to \$62 million to conduct the most promising public interest energy research by partnering with Research, Development, and Demonstration (RD&D) organizations, including individuals, businesses, utilities, and public or private research institutions.

PIER funding efforts are focused on the following six RD&D program areas:

- Buildings End-Use Energy Efficiency
- Industrial/Agricultural/Water End-Use Energy Efficiency
- Renewable Energy
- Environmentally-Preferred Advanced Generation
- Energy-Related Environmental Research
- Strategic Energy Research.

What follows is the final report for the [Grant Project Name], [Grant Number], conducted by the [Company/Organization/Affiliation]. The report is entitled [Report Title]. This project contributes to the [PIER Program Area] program.

For more information on the PIER Program, please visit the Commission's Web site at: <http://www.energy.ca.gov/research/index.html> or contact the Commission's Publications Unit at 916-654-5200.

Executive Summary

A final report in miniature, containing all key information. Summarizes the introduction, purpose, project objectives, project outcomes, conclusions, recommendations and benefits to California. It is intended to be short, bullet formatting is suggested. Assume a non-technical, management-level readership. You may want to write this as if you will hand it out at a trade show. Emphasize the benefits of the project and include who should care and why. Put on the hat of an inquisitive, reasonably well-educated lay reader who may be interested in purchasing or implementing the subject technology. Pretend that they just paid for this research project and they want to understand how and why you spent their money.

If your project has more than one project, repeat this organization for each project area. The Executive Summary needs to summarize the report, not present new information found nowhere else in the document. Go the Commission web site for further examples.

Abstract

This section should be the technical counterpart to the executive summary. Less marketing and sales oriented than the Executive Summary. This should be similar to what you would find in a technical trade periodical. Limited to 250 words, essentially a very brief, Executive Summary. The Abstract covers the purpose, objectives, outcomes and conclusions. Contains 5-10 keywords for computer searches. Geared toward a more technical audience.

Introduction

- Background and Overview (Why this project was necessary) - Provide relevant background, identify this project's subject area and the goals of this research. Use Stages and Gates terminology, where appropriate, to identify what stage the project has reached in its path to market. Refer to the contract for this information.
- Project Objectives (What you planned to accomplish) - Present the technical and economic objectives for your project. The objectives need to contain the way(s) to measure or know the success of having reached the objective. Use Stages and Gates terminology where appropriate. These should be taken from the contract and should reflect any changes made during critical project reviews or at other times during the course of the project. (Describe why these changes were made in the Project Approach section.)

Each objective shall be separately identified, a useful form is:

Project objectives were to:

- Verify (an action verb followed by relevant text)....
- Determine....
- Measure...
- Develop....
- Report Organization – Provides a roadmap to the rest of the report. If there are separate final reports for a multitasked project, set the context in Background section and refer the reader to their location here.

Project Approach

This section discusses the tasks you undertook and your approach to the research (What you did to accomplish your objectives). Discuss the testing procedures you undertook and the system modifications and improvements you made.

Project Outcomes

This is where you present your results (What happened). Organize this section so that results are presented in the same order as the objectives. A short version of each Outcome should be stated in bullet form. Supporting paragraphs that describe each Outcome should follow each bullet.

There can be more Outcomes than there were Objectives. For example, there may be more than one Outcome per Objective. It is also possible to have an unanticipated Outcome during your research. However, you cannot have stranded objectives; all Objectives, whether met or not, must be discussed in this section. If this section is particularly long, then it is useful to create a summary at the end of this section where all of the bullets are drawn together as a summary.

Conclusions and Recommendations

- **Conclusions** (What you learned from what happened) - Organize the Conclusions in the same order as Objectives and Outcomes. You may have Conclusions that are broader than individual Objectives and Outcomes. Please present these after you present the individual Conclusions. Conclusions must be drawn from evidence presented in the report.
- **Commercialization Potential** - This is where you should directly address stages and gates. Explain where your project is in stages and gates. If your project had a task to prepare a Production Readiness Plan or a similar effort related to assessing where the research is in relationship to being used in its relevant markets (i.e. Stages and Gates), this is the place to discuss that task.
- **Recommendations** (What you think should occur next) - Recommendations should derive from the Conclusions presented. Recommendations specific to individual Objectives, Outcomes and Conclusions should be presented in the original order. General Recommendations should follow. Use Stages and Gates terminology where appropriate. What is the next stage for this project?
- **Benefits to California** - This section discussed two issues: (1) what benefits has California already received from this contract, if applicable, and (2) if this project is successful and the results widely used, how will California benefit. These benefits need to be related to the problems this research was intended to address. Refer to the Introduction section of the report.

Endnotes

Endnotes are preferred to footnotes.

Glossary

If there are more than 10 acronyms then a glossary with definitions for each acronym should be provided at the end of the report.

References

This is where you list all documents referred to in the body of the report. List references in standard bibliographic format. Be sure to check that shorthand references contained in the body of the report are accurate. Any documents referred to in the Appendices should be listed in the reference section in the appropriate Appendix.

Appendices

Designated by Roman numerals.

Attachments

If absolutely required, designated by Roman numerals.

Here is some additional guidance on how to ensure that the reports are technically accurate and internally consistent:

1. Put on the hat of an inquisitive, reasonably well-educated lay reader. Pretend that they just paid for this research project and they want to understand how and why you spent their money.
2. Apply the test of completeness. Are all the pieces there? Are all the references clear and do those in the text match those in the reference section? Are the relationships between the partners and the players clearly explained?
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6. The objectives of the research project need to be clearly stated. The objectives of the Commission funded research project need to be clearly differentiated from the objectives of the overall program of which the research is a part. The objectives of the program should not be intermingled with the objectives of the project. If some objectives of the program will be performed elsewhere, or at another time, this needs to be explained. The report should then stay focused on the objectives of this project.
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9. Data that is presented in the report needs to be analyzed. If you present a picture, graph or table, be sure that you discuss it in the text, not just refer to it.
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11. Figures and Tables must clearly relate to, and be consistent with the text, and vice versa. (If the text says the generator had a capacity of 30 kW, the table shouldn't say it was 31.2 kW.)
12. Use consistent references to report performance specifications and results. For example, if a piece of equipment is to be referred to by its nominal nameplate rating then use that reference consistently throughout the report. If however the desired number was the measured performance of the device, (almost always different from nameplate) then consistently use that measured number. Do not mix the two in the narrative.
13. The text needs to clearly refer to the attached appendices. It should also explain how the data in the appendices matters to the text. If it doesn't really matter, it probably should be dropped. (You may still need it because it is a deliverable according to the contract, so check this carefully.) References to multi-page appendices need to be specific to the page or section of the appendix, not just a general reference to Appendix X.

**Products and Due Dates
(Grant Exhibit B)**

APPLICATION MANUAL ATTACHMENT 8

Name of Company or Organization

Task Number	Task Name	Product(s)	Planned Start Date	Planned Completion Date
1.0	Project Start-Up Tasks			
1.1	Attend Kick-off Meeting	Kick-Off Meeting		
1.2	Document Match Funding	Cash/In-kind lists, commitment letters		
1.3	Identify Required Permits	Permit plan or no permits required letter, updated list of permits, and a copy of approved permits		
2.0	Technical Tasks			
2.1	Name of Task 2.1	1. Name of Product for Task 2.1		
2.2	Name of Task 2.2	1. Name of Product for Task 2.2		
2.3	Name of Task 2.3	1. Draft of Product for Task 2.3		
	Critical Project Review			
		2. Final of Product for Task 2.3		
2.4	Name of Task 2.4	1. Name of Product for Task 2.4		
2.5	Name of Task 2.5	1. Name of Product for Task 2.5		
2.6	Name of Task 2.6	1. Name of Product for Task 2.6		
2.7	Name of Task 2.7	1. Draft of Product for Task 2.7		
	Critical Project Review			
		2. Final of Product for Task 2.7		
2.8	Name of Task 2.8	1. Name of Product for Task 2.8		
2.9	Name of Task 2.9	1. Name of Product for Task 2.9		
2.10	Name of Task 2.10	1. Name of Product for Task 2.10		
3.0	Reporting Tasks			
3.1	Monthly Progress Reports	Monthly Progress Reports		
3.2	Final Report			
3.2.1	Final Report Outline	Final Report Outline		
3.2.2	Draft Final Report	Draft Final Report		
3.2.3	Final Report	Final Report		
3.3	Final Meeting	Meeting Participation		
		Written Documentation of Meeting Agreements		

INSTRUCTIONS FOR PROVIDING BUDGET INFORMATION

(Grant Budget Exhibits C)

The Applicant and Major Subcontractors must submit information on all the Budget Exhibit forms described below. *(For purposes of this Solicitation, a “Major” Subcontractor is one that is requesting \$100,000 or more of PIER funds. “Minor” Subcontractors, i.e., those requesting less than \$100,000 of PIER funds, do not need to provide detailed budget forms and spreadsheets.)*

Instructions for Budget Exhibit C1, Personnel Hourly Rates and Benefits

- List the names of Key Personnel, important personnel, and the name or job classification for other personnel. Include Minor Subcontractors and consultants if they are Key Personnel.
- For each person or job classification list: direct hourly rate (\$) and fringe benefit rate.
- If rates will change over the duration of the project, provide estimated rates for appropriate time periods.
- If rates will change if this project extends beyond the anticipated completion date, please provide estimated rates for one year past the anticipated completion date.

Instructions for Budget Exhibit C2, Calculation of Fringe Benefits and Overhead

You must include documentation in your cost proposal to support your Fringe Benefits and Overhead rates. If the Federal Defense Contracting Audit Agency (DCAA), any other governmental entity or private audit firm has audited and accepted your rates, please provide this documentation.

- Provide fringe benefit and overhead rates. Different types of overhead (e.g., indirect and G&A) may be combined in a single column if they are applied to the same items. Change the column headings, if necessary, to match your chart of accounts.
- List the items to which you apply each type of overhead.
- Show the formulas you use to calculate billable charges for each of the listed expense items (the categories in the Exhibit C3, Detailed Task Budget spreadsheets).
- If rates or formulas will change if this project extends beyond the anticipated completion date, please provide estimated rates for one year past the anticipated completion date.

Instructions for Budget Exhibit C3, Detailed Task Budgets

General

- The Applicant and all “Major” Subcontractors should use the Excel workbook (file: Detailed Task Budgets - C3) to present detailed budget information.
- Do NOT enter data in the blue cells – they contain formulas. Insert additional rows if necessary, but check the subtotals in the blue cells to ensure that the proper range of cells is included in the calculation.
- Do NOT enter data in the last spreadsheet (Summary tab). This is the total project budget, which is calculated from data in the prior spreadsheets. The Summary spreadsheet is protected, but with no password. If you need to add tabs for additional technical tasks (and if you are experienced working with Excel), you can unprotect the Summary, add rows for the additional tasks, and correct the Technical Activity Subtotals.

Task Budgets - Spreadsheet Tabs

- Provide budget figures for the task levels indicated by the tabs in the workbook, i.e., Task 1.0, Task 2.1, 2.2, 2.3, ..., and Task 3.1, 3.2, 3.3.
- Task 1.1, Kick-off Meeting, is reimbursable by PIER. Budget for one or two people for technical and administrative discussions with PIER staff in Sacramento. Tasks 1.2 and 1.3 are not reimbursable by PIER.
- For appropriate (not all) Technical Tasks (2.1, 2.2, ...), budget for Critical Project Reviews, which are reimbursable by PIER. These may be in Sacramento or at your facility.
- For Task 3.2, the Final Report, budget for 1-2 months for your top technical person and/or best technical writer.
- Task 3.3, the Final Meeting, is reimbursable by PIER. Budget for one or two people for technical and administrative discussions with PIER staff, either in Sacramento or at your facility.

Detailed Budgets for Each Task

- **PERSONNEL (DIRECT LABOR):** List the names of Key Personnel and important personnel, and the names or job classifications for other personnel. With each name or job classification, include the number of labor hours for the task and the hourly salary.

The labor costs for each task must be consistent with the hourly rates in Budget Exhibit C1 and the formulas in Budget Exhibit C2.

- **FRINGE BENEFITS:** Indicate the total fringe benefits for the above labor costs. If fringe benefits are included in the hourly rate, indicate here and provide fringe benefit rate used.
- **TRAVEL:** List each trip (or category of trip), purpose of trip, and itemization of costs.

APPLICATION MANUAL ATTACHMENT 9

- **EQUIPMENT:** Itemize, with costs per item. “Equipment” means tangible, non-expendable items with an acquisition cost of \$5,000 or more, **and** a useful life of more than one year. “Equipment” also includes groups of items with individual costs less than \$5,000, which will be assembled into a single item with a value of \$5,000 or more and a useful life of more than one year.
- **MATERIALS:** Itemize, with costs per item. This includes all materials and supplies that will be exhausted during the task. “Materials” have a cost less than \$5,000 **and/or** a useful life of less than one year.
- **MISCELLANEOUS:** List and provide costs for other items that do not fall in any of the above categories.
- **OVERHEAD COSTS:** Indicate rate, basis and total charges for overhead (indirect, G&A, etc.). These should be consistent with the formulas shown in Budget Exhibit C2.
- **SUBCONTRACTORS:** List the names of subcontractors and the amount of each subcontract. This should be consistent with the formula shown in Budget Exhibit C2.

In your proposal include the detailed budget for each task and the Summary budget. Shown below is a sample of budget information as it should be presented for each task in the Detailed Task Budget spreadsheets:

SAMPLE BUDGET

Name of organization				
Title of Project				
Technical Task 2.3				
Title of Task		Total \$	Match Funding \$	CEC Cost
Personnel (Direct Labor) (List personnel names and/or job classifications, with number of hours and hourly rate for each.)	Subtotals	16,600	5,000	11,600
(Name), Project Manager (50 hours @\$100)		5,000	2,000	3,000
(Name), Mechanical Engineer (200 hours @ \$50)		10,000	3,000	7,000
Machinist I (40 hours @ \$40)		1,600	0	1,600
				0
Fringe Benefits (specify rate and basis) (20% of Direct Labor)		3,320	1,000	2,320
Travel (Describe types of travel expenses and number of trips.)	Subtotals	300	0	300
10 trips to project sites to monitor installation				
@ 30¢/mile @ approx. 100 miles per trip		300	0	300
				0

APPLICATION MANUAL ATTACHMENT 9

				0
Equipment (List items with cost >\$5,000 and life > 1 year.)	Subtotals	50,000	50,000	0
5 pumps (describe type) at \$10,000 each		50,000	50,000	0
				0
				0
Materials (List items and quantities.)	Subtotals	200	0	200
Electrical wire		200	0	200
				0
Subcontracts (List companies/organizations.)	Subtotals	14,000	2,000	12,000
XYZ Corp., equipment installation contract		10,000	2,000	8,000
John Smith, Ph.D., consultant (10 days @ \$400/day)		4,000	0	4,000
Miscellaneous	Subtotals	0	0	0
				0
				0
Total Direct Costs	Subtotals of All Above Categories	84,120	58,000	26,120
Overhead (Indirect, G&A, etc)	Subtotals	22,000	13,400	9,400
Overhead (Specify rate and basis) (20% of Total Direct Costs)		16,824	11,600	5,224
G&A (Specify rate and basis) (30% of (Direct Labor +Fringe))		5,976	1,800	4,176
TOTALS for Task 2.3		106,920	71,400	35,520

APPLICATION MANUAL ATTACHMENT 9

PERSONNEL HOURLY RATES AND BENEFITS
(Grant Budget Exhibit C1)

To be filled out by the Applicant and for Major Subcontractors (requesting at least \$100,000 of PIER funds). List the names of key and important personnel, the name or job classification for other personnel, the direct hourly rate and fringe benefit rate. If rates will change over the duration of the project, provide estimated rates for appropriate time periods. Use these rates to develop your task budgets. Use as many sheets as necessary.

Organization name: _____

[illegible][illegible]

APPLICATION MANUAL ATTACHMENT 9

CALCULATION OF RATES **FRINGE BENEFITS AND OVERHEAD RATES** **(Grant Budget Exhibit C2)**

To be filled out by Applicant and Major Subcontractors (requesting at least \$100,000 of PIER funds).

Organization name: _____

Rates (percentages) for time intervals covering the duration of the project	Fringe Benefits (FB)	Indirect Overhead (OH)	General & Administrative (GA)
Rates from _____ to _____	%	%	%
Rates from _____ to _____ (Estimate)	%	%	%
Rates from _____ to _____ (Estimate)	%	%	%

	Fringe Benefits	Indirect Overhead	General & Administrative
List items included in fringe benefits, overhead and G&A, (e.g., vacation, retirement plan, telephone, secretarial, rent/lease, insurance, etc.)			

PLEASE NOTE

ATTACHMENT 9 IS NOT AVAILABLE AS AN ADOBE ACROBAT PDF FILE BECAUSE IT IS A MICROSOFT EXCEL SPREADSHEET THAT HAS EMBEDDED CALCULATIONS.

YOU WILL NEED TO DOWNLOAD THE EXCEL FILE -- Attachment_09-C3.xls -- SEPARATELY.

**Summary of Allowable Travel and Per Diem Expenses
(Grant Budget Exhibit C4)**

Recipients shall be reimbursed for travel and per diem on the same basis as nonrepresented State employees. The rates listed below will be in effect for the term of this Agreement, unless and until the State's per diem reimbursement rates for nonrepresented employees are revised. Travel expenses not listed in this section cannot be reimbursed.

Travel that has not been budgeted in the Budget shall require prior written authorization from the Commission Project Manager. Travel shall be paid from the Recipient's office location where the employees assigned responsibilities for this agreement are permanently assigned.

Recipient must document and prepare travel expense claims as follows:

- Recipient's invoice must detail expenses using the rates listed below.
- Expenses must be listed by trip including dates and times of departure and return, in order to establish appropriate per diem rates (employee's travel claim may be attached instead).
- Attach required receipts for travel expenses claimed (receipts are not required for meals or incidentals within allowable rates, but you must retain all meal receipts for audit by the State or IRS).

Transportation Rates

1. Common carrier, airline coach class or equivalent are reimbursable in accordance with receipts or vouchers attached to Recipient's invoice verifying expenditure.
2. Private or Recipient-owned automobile mileage is reimbursable up to 34 cents per mile. However, if travel by common carrier is more economical than by automobile, the rate for the common carrier will be reimbursed.
3. Rental car receipts must be attached to Recipient's travel expense claim. However, if taxi service is less expensive than a rental car the rate for taxi will be reimbursed. **NOTE: Insurance coverage is not reimbursable.**
4. Parking fees, taxi fees, tolls and public transit fees may be reimbursed up to \$10.00 without receipt.

In-State Travel Per Diem Rates

1. Apply to travel **more than 50 miles** away from Recipient's headquarters,
2. Per diem is reimbursable as follows:

APPLICATION MANUAL ATTACHMENT 9

- a) **Less than 24 hour trip**, Recipient shall be reimbursed for meals and lodging according to the following rates:

Breakfast:	Up to \$ 6.00, if began at or prior to 6 a.m. and terminated at or after 9 a.m.
Lunch:	Not reimbursed on trip of less than 24 hours
Dinner:	Up to \$18.00, if began at or prior to 4 p.m. and terminated at or after 7 p.m.
Incidentals:	Not reimbursed on trip of less than 24 hours

- b) **More than 24 hours**, Recipient will be reimbursed for each 24 hour period for meals, lodging and incidentals according to the following rates:

Breakfast:	Up to \$ 6.00 if trip began at or before 6 am.
Lunch:	Up to \$ 10.00 if trip began at or before 11am.
Dinner:	Up to \$18.00 if trip began at or before 5 pm.
Incidentals:	Up to \$6.00

- c) Time Frame for fractional day after 24 hours of travel:

Breakfast:	If trip ends at or after 8 a.m.
Lunch:	If trip ends at or after 2 p.m.
Dinner:	If trip ends at or after 7 p.m.

3. Lodging (Receipt Required)

- a) Statewide, except in b) and c) below, actual receipted lodging up to \$84.00 per night plus tax.
- b) When required to obtain lodging in the counties of Los Angeles and San Diego, reimbursement will be for actual receipted lodging to a maximum of \$110.00 per night plus tax.
- c) When required to obtain lodging in the counties of Alameda, San Francisco, San Mateo and Santa Clara, reimbursement will be for actual receipted lodging to a maximum of \$140.00 per night plus tax.

Out-of-State Travel Per Diem Rates

Meals/Incidentals: Same as in-state rates

Lodging: Actual expense with receipt (subject to Commission Project Manager approval).

Out-of-Country Travel Per Diem Rates

Meals/Incidentals: Actual expense in accordance with foreign travel rates published by U.S. Government.

Lodging: Actual expense with receipt (subject to Commission Project Manager approval).

EXAMPLE ONLY**CONFIDENTIAL AND PRE-EXISTING INTELLECTUAL PROPERTY LIST
(Grant Exhibit D)**

For _____ Corporation

As of the effective date of this contract:

Description of property	Basis for its Proprietary Nature (Serial No./Patent No.)
Improvement of _____ Production From Lignocellulose	Patent Pending (08/833,999-*)
(08/879,999-*) (note1)	Patent Pending
Development of High-_____ Resistant Escherichia Coli	Patent Pending (08/888,900-*)
Recombinant Uptake System	Patent Pending (08/777,222-*)
Recombinant Cells that Chromosomally Integrate Heterologous Genes	Patent Pending (09/111,000-*)
Interim Report to _____ by _____	Trade Secret
Supplementary Results on batch hydrolysis of Sugar cane bagasse hemicellulose	Trade Secret
Pilot Project for extraction and purification of taxanes(<i>Final Report September 1997</i>)	Trade secret
Process for preparing a high purity chemical free cellulose form a chemical	<i>Patent Corporate Treaty Patent pending Canada -98</i>

* means Patent Pending and no assignment of Patent Number yet.

Note 1: Title of patent pending reveals significant business sensitive information. Title is being withheld until patent is issued. Serial Number identifies the item in question.

Note 2: Each explanation needs to be clear enough to -describe the item as it exists as of the effective date of the contract but not so detailed that it gives away the trade secret.